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[OFFICIAL NOTICE.]

Detroit Meeting, American Gas Institute.

HEADQUARTERS, AMERICAN GAS INSTITUTE,
25 West 39th street, New York, Sept. 23d, 1909.

The following preliminary outline of the plans underway for the Detroit meeting of the American Gas Institute, to be held in that city, October 20, 21 and 22, may be of interest. The Committee of Arrangements, as appointed by President Prichard, was made up as follows: Irvin Butterworth, Chairman; J. T. Lynn, J. J. Knight, B. O. Tippy, W. T. Barbour, W. S. Blauvelt.

With the approval of the President, Mr. Butterworth has added to the list a number of men prominent in the gas industry. The Sub-Committees are now arranged as follows:

Ways and Means Committee.—James T. Lynn, Chairman; W. T. Barbour, Geo. H. Barbour, James W. Dwyer, John J. Knight, Frank Hulswit, Lazard Kahn, D. J. Collins, J. N. Williamson.

Smoker.—Jules G. Hoffman, Chairman; Alonzo P. Ewing, A. L. Zwisler, F. P. Mueller, Ed. Leaky.

Boat Trip.—V. F. Dewey, Chairman; W. S. Blauvelt, Jas. Foley, Roy Shacklette.

Entertainment of Ladies.—H. L. Olds, Chairman; W. G. Henry, W. R. Vanvalkenburg, Andrew H. Green, Jr., Samuel T. Douglas, W. E. Moss, B. O. Tippy, Stanhope Boal, W. C. Kennedy, George D. Roper, George M. Clark, Charles H. Dickey, A. T. Knowlson.

Hotels, Hall and Information.—E. F. Lloyd, Chairman; George Osius, Edward M. Mabcourt, G. O. Ciliax.

The Committee has decided to arrange for an informal "Smoker" at the Wayne Pavilion, instead of a banquet. There will be a theater party, luncheon at the Country Club and trips about the city for the ladies. A steamboat trip to Lake St. Clair, down the river to Bois Blanc, including an inspection of the very interesting engineering work at the new channel, and a visit to the Solvay Process plant, will be features. The headquarters will be at the Pontchartrain, and the meetings will be held at Elks' Hall, only a block distant.

Mr. R. B. Brown, Chairman of the Technical Committee, advises that about 16 papers are being prepared, and that Dr. Hyde has consented to give a lecture on "Illuminating Engineering."

There will be three good papers on commercial subjects, one on "Accounting," one on "Illuminating Engineering in Practical Applications," and a first-class technical and general programme.

The reports from the "Wrinkle Department," "Bureau of Information," and the various committees, will contain matter of unusual interest.

HOTEL ACCOMMODATIONS.

The following hotel information is presented for your consideration:

Hotel Pontchartrain—European Plan.—Rooms with hot and cold running water, 1 person in room, $2 to $2.50 per day. Room with hot and cold running water, 2 persons in room, $3 to $4 per day; room with bath, 1 person in room, $3, $3.50, $4, $5 per day; 2 persons, $5, $6, $7, $8 per day. This hotel will take care of about 250 people comfortably. They advise, however, that they have not very many single rooms, and it will be advisable for people desiring reservations to make them as quickly as possible. This hotel will be headquarters, and will be remembered by previous visitors to Detroit as on the site of the old Russell House. It is within sight of and about 2 minutes' walk from the Convention Hall. It is reached from all depots by any car at the depot without change.

Hotel Cadillac—European and American Plan.—Rooms without bath on the American plan $3.50 and $4 per day, each person; rooms with bath, $4, $5, $6, $7, $8 per day, each person. Rooms without bath, on the European plan, $2 to $2.50 per day, each person. Rooms with bath, $3, $3.50, $4, $5, $6 per day each person. They can accommodate 100 to 150 people. This hotel is located at the corner of Michigan avenue and Washington boulevard, and is 5 minutes' walk from the meeting hall, with a direct car line thereto. It is reached by car line from all depots, transferring at the City Hall to Michigan car. Transfer point is 3 blocks from hotel.

Wayne Hotel.—American Plan.—Without bath, $2.50 to $4 per day; with bath, $4.50 per day.

European Plan.—Room without bath, $1.50 to $2 per day; with bath, $2.50 to $3 per day. Two persons in one room, without bath, $2.50 to $3 per day; with bath, $4 to $4.50 per day.

This hotel will be able to accomodate about 50 people, and is located across from the Michigan Central depot and overlooking the river. It is 7 minutes by direct car line to the meeting hall and about 15 or 20 minutes' walk. The "Smoker" for Thursday evening will be held in the pavillion annex of this hotel.

Hotel Tuller.—European Plan.—Every room with bath, 1 person in a room, $2 to $4; 2 persons in a room, $3 to $5. They can accommodate about 100 people. The hotel is located at the corner of Adams and Park, which is one block off Woodward, facing Grand Circus Park, and is about 5 minutes walk from the meeting hall. It is reached by Woodward car line from Michigan Central depot. From Lake Shore, Grand Trunk and Union depots by any car with transfer to Woodward.

Hotel Ste. Claire.—American Plan.—With bath for one, $3.50 and $4; two, $7 and $8. Without bath for one, $2.50 and $3; two, $5 and $6. This hotel will accommodate 50 or 60 people nicely. It is located at the head of Monroe avenue, in sight of and two minutes walk from

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the meeting hall. It is reached by all car lines from depots, transferring to Michigan car at City Hall. Transfer point is 3 blocks from hotel. Cars from Lake Shore depot pass hotel.

Griswold House.—European Plan.—Rooms, with running hot and cold water, $1 per day; rooms, with bath, $1.50 and $2 per day. Where more than one person occupies the same room, the rate for each additional person is $1 per day. The hotel is located at the corner of Grand River avenue and Griswold street, about 5 minutes walk from meeting hall. Is reached by Woodward cars from Michigan Central depot within one short block. Is reached from Union, Lake Shore and Grand Trunk depots by transfer to Jefferson cars, which pass the door.

Hotel Normandie.—European and American Plan.—European plan: $1, $1.50, $2 per day, without bath; $2, $2.50 per day, with bath. Where two or more occupy the same room, a reduction of 50 cents is made, except with the minimum rate. This hotel is located on Congress street, ½ block east of Woodward, and in the same block as the Pontchartrain. Five minutes walk from meeting hall, and is reached direct by car line from all depots.

Hotel Metropole.—European Plan.[1]—Rooms, without bath, $1; with bath, $1.50. This hotel is located on Woodward avenue, alongside the Pontchartrain.

Oriental Hotel.—European Plan.[2]—$1 to $2 per day, *with free use* of the plunge and shower baths. This hotel also has Turkish and Russian bath house annex, and is located on Farrar street near Gratiot avenue, about 3 minutes' walk from the meeting hall. Is reached within 2 blocks by direct car line from any depot.

In going over the matter with the hotel people they urge that everyone who is going to attend the convention, write and engage their accommodations, and that this be done with very little delay. They should state exactly the date and hour when they expect to arrive, if not in the first communication reserving the room, at least in a subsequent communication to the hotel in order that the accommodations may be ready for them on arrival.

Detroit is particularly a Convention City, and a clearing point for tourists to all points north, as well as a gateway for tourists and commercial travel east and west, hence in the middle of October, if accommodations are not properly reserved, it may be difficult to get anything suitable or satisfactory. A. B. Beadle, Secretary.

BRIEFLY TOLD.

The Detroit Meeting of the American Gas Institute.—The announcements that have been made continuously over a period of two months, from the office of the Secretary of the American Gas Institute, respecting the meeting thereof in Detroit next week, have been sufficiently ample to show that from the technical points everything is ready. The experts in this respect at the Detroit meeting place have been so well up with their work that, even at this early day, a forecast of their arranging can be given which will be in close revealing to the bringing off thereof. Those in charge very wisely considered it best to make no especial provision on entertainment account the evening of the first day, which time will be largely availed of that those in attendance may become "the better acquainted." This means many dinner parties, theater visits and the like the evening of Wednesday. Through the forenoon of the second day the ladies will be given special opportunity to view the many beauties of Detroit and its environments, which are veritably of the order good. It is proposed to fittingly end this trip—of course, automobiles will be the moving spirits—at a luncheon served in the beautiful home of the Country Club at Grosse Point. In the evening there will be a theater party, the selection of the show to be determined. During the evening of the second day the "big smoker party," which is to be the real feature of the entertainment for the masculine section of the attendance, and which will take the place of the usual formal banquet, will be brought off. Everything has been done that possibly could be thought of in advance to cause this entertainment to be of the most enjoyable sort. If the evening is warm, the meeting place will be cool; if the evening is cool, the meeting place will be warm. Music will enliven the feast, and it will afterwards harmonize the vaudeville entertainment with which the "smoker" will be snuffed out. The third day will be given over to a boat trip, for which it is ordained that the steamer "Pleasure" will await the embarking party—the hour is set for 10 A.M.—at the foot of Woodward avenue. The water way is around lovely Belle Isle, into Lake St. Claire, close to the Grosse Point shore, enabling one to have more than passing glimpses of the beautiful homes that line the shores. The route provides for an approach to Lake Erie. At the mouth of the Detroit river the boat will circle Blanc Island, stopping at the new Livingston Channel, which huge engineering work is being done on the west side of the Island. Here the boat will be tied up alongside some anchored lighters, which will afford floor space for those who wish to listen to a lecture on the engineering features of the excavation, which are many, unique and interesting. The lecture will be delivered by the Engineer in charge. The lecture concluded, the boat will proceed up the river to the Semet-Solvay Company's works, at which point the men will disembark to be the guests of the Company and to inspect the magnificent new coke plant, which embodies the latest developments in by-product coke oven construction and practice. This arrangement is certainly timely for, remembering that every year more or less closer relations with by product manufacture and the gas business *per se* are being maintained, an inspection of the latest practices connected therewith must be productive of good. Those who do not wish to stop at the Solvay works, including the ladies, will be taken immediately in the boat to Detroit, where they will disembark, the boat at once returning to the Solvay plant to bring back to the city those desiring to board the evening trains. For details in this connection we are indebted to the courtesy of Mr. Irvin Butterworth, Chairman of the Committee, and also to the attention of Mr. James T. Lynn.

1. Strictly "stag." 2. Strictly "stag."

Just Note Those Meter Test Figures.—The attention of people in authority in the premises is asked for an examination of these figures which are hurriedly taken from the annual report of the Inspector of Gas and Meters, for the District of Columbia. Inspector Runyan says: "During the year this office inspected and proved 7,071 gas meters, this being the greatest number of meters that has passed through this office in any one year since the office was established. Of this number, 3,277 were new meters, 1,620 repaired, 1,399 consumers' complaint and 775 Company complaint meters. Requests for meter inspections were received from 1,340 consumers supplied by the Washington Gas Light Company and classified in this office as Washington consumers. A thorough inspection of these complaint meters showed that 471, or 35.15 per cent., were registering fast, average error 5.01 per cent.; 80, or 5.97 per cent., were slow, average error 5.95 per cent., and 789, or 58.88 per cent., registered correctly. Of 771 meters inspected on request of the Washington Gas Light Company, 19, or 2.46 per cent., proved to be registering fast, average error 4.33 per cent.; 408, or 52.92 per cent., were slow, average error 23.97 per cent.; 28, or 3.63 per cent., were correct, and 316, or 40.99 per cent., did not register any of the gas passing through them."

[Special Correspondence.]

SEVENTEENTH ANNUAL MEETING, PACIFIC COAST GAS ASSOCIATION.

San Francisco, Cal., September 25, 1909.

The Seventeenth Annual Session of the Pacific Coast Gas Association was convened at San Francisco, September 21st, at the conclusion of which it was the consensus of all present that it was one of the most successful and best attended meetings the Association ever held. Mr. W. B. Cline (Los Angeles, Cal.), Vice-President of the Association, was in the chair, owing to the serious illness of the President, Mr. George S. Colquhoun, of San Francisco; and, owing to the absence of the Secretary, Mr. John A. Britton, of San Francisco, in the Orient, Mr. Henry Bostwick, of San Francisco, Assistant Secretary, acted. It will not be amiss at this time to say that this is the first convention of the Association that Mr. Britton has not been in attendance upon since its organization. However, a letter was read before the convention, by Mr. E. C. Jones, from Mr. Britton, who expressed his deep regret over his inability to be present and wished the Association and its members much future success and happiness. A letter was also read from the President of the Association, Mr. Colquhoun, expressing his sorrow at his inability to be in attendance, due to his continued illness, but he stated that he hoped to make up for lost time at the coming convention of the Association. A cablegram was received from Mr. C. O. G. Miller, Past-President of the Association, who is at present in London, wishing the Association a successful meeting.

The convention was called to order promptly at 10 o'clock Tuesday morning, September 21st, in the Assembly Hall of the new office building of the San Francisco Gas and Electric Company, and answers to roll call showed there were about 125 members in attendance. The members from most distant points in attendance were Mr. H. L. Strange, of Honolulu; Mr. Herman J. Trenkamp, of Cleveland, O.; Mr. J. F. Parker, of Rockford, Ills., and Mr. W. P. Hutchinson, of Marion, Ia.

Applications from 28 wishing to become new members (23 active and 5 associate) were balloted upon and all were unanimously elected.

The report of the meeting of the Board of Directors, held the evening of the 20th September, was read and, wherein it was recommended

that the 18th annual convention of the Association be held in Los Angeles, Cal., 1910. Upon the matter being placed before the members, Los Angeles was unanimously declared to be the next meeting place of the Association.

The President's address, by Mr. W. B. Cline, was a paper of much merit and was classified under the general heads of "Manufacture," "Distribution," "Rates," "Legislation," "Litigation" and "Miscellaneous." The following papers were then read before the convention and all were fully discussed, full reports of those discussions will be published in the JOURNAL at an early date, as well as all papers read before the convention, and it will be of much benefit to all members of the Association to give the same very close perusal, as a great many very interesting facts were uncovered:

"Methods of Education of Consumers," by Mr. Wm. Baurhyte, Los Angeles.

"Public Benefits Derived from Water Power Development in California," by Mr. John Martin, San Francisco.

"The Emergency Service of the Los Angeles Gas and Electric Corporation," by Mr. C. S. Vance, Los Angeles.

"The Gas Exposition as a Means of Advertising," by Mr. John D. Kuster, San Jose, Cal.

"Some Results of Personal Interviews with the Dissatisfied Consumer," by Mr. John Clements, Oakland.

"The Public and Its Complaints," by Mr. C. L. Barrett, San Francisco.

"Underground Electric Construction," by Mr. S. J. Lisberger, San Francisco.

"Damage Claims: A modern View," by Mr. J. P. Coghlan, San Francisco.

"A Word About Gas Collections," by Mr. Homer F. Keyes, Sacramento, Cal.

"Gas Distribution in San Francisco," by Mr. W. R. Morgan, San Francisco.

"Some Notes on Naphthaline Conditions in California," by Mr. Sherwood Grover, Oakland, Cal.

"Effective Gas Lighting," by Mr. R. J. Thompson, San Francisco.

"New Business Methods." by Mr. T. D. Petch, Santa Rosa.

"Oil Gas Residual and How to Handle It," by Mr. R. P. Valentine, Los Angeles.

The meeting adjourned at 5 P.M. Tuesday, to meet again on Wednesday, at 10 A.M., and continued during that day, until 5 P.M., when adjournment was taken until 7 P.M. At the latter time it was to meet at the banquet board, which had been prepared in the beautiful Colonial Ball Room of the Hotel St. Francis.

The following gentlemen were elected to serve as officers for the current year:

President.—Mr. W. B. Cline, Los Angeles.

Vice-President.—Mr. Frank A. Leach, Jr., Oakland.

Secretary and Treasurer.—Mr. John A. Britton, San Francisco.

Assistant Secretary and Treasurer.—Mr. Henry Bostwick, San Francisco.

The following gentlemen were elected to serve as Directors: Mr. C. Froelich, San Francisco, Cal.; Mr. F. V. T. Lee, San Francisco, Cal.; Mr. C. S. Vance, Los Angeles, Cal.; Mr. C. A. Luckenbach, Los Angeles, Cal.

Mr. L. P. Lowe, of San Francisco, was appointed as a committee of one to address a cablegram to Mr. Britton, at Hongkong, expressing regret at his absence and wishing him a pleasant trip home.

A committee was also appointed to wait on past-President Colquhoun, to extend to him the sympathies of the members of the Association on account of his illness, and at the same time to present him with a basket of flowers as a token of esteem of the Association.

It has been the practice of the Pacific Coast Gas Association to award to the author of the most interesting paper presented before its convention a gold medal, should any of the papers be of a character to warrant such award. This year the committee awarded the medal to Mr. John Martin, of San Francisco, who read a paper on "Public Benefits Derived from Water Power Development in California." And while this paper does not deal with the gas end of the business in any wise, still it dealt with a subject which has had much to do with the upbuilding of California, and the action of the committee in making this award met with the hearty approval of all the members.

The banquet Wednesday evening was attended by 100 members, Mr. Cline, President-elect, acting as Toastmaster. The speakers of the evening were Messrs. F. V. T. Lee, John Martin, E. C. Jones, L. P. Lowe, J. F. Parker, Rockford, Ills., H. L. Strange, Honolulu, F. A. Leach, Jr., John Werry, Nevada City, and J. T. Shade, Los Angeles. An excellent orchestra was in tuneful attendance, and Mr. H. R. Basford, of the Association, favored with a vocal selection.

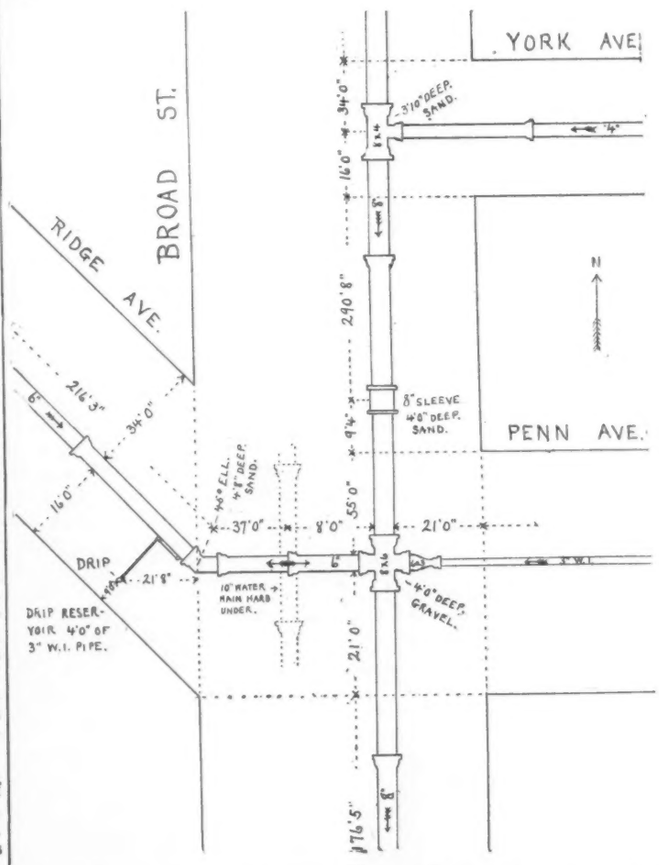
The Seventeenth Annual Outing of the Association was to the beautiful Muir Woods, at the foot of Mt. Tamalpais, Marin county, which is a 2-hour ride from San Francisco, the members and their families taking the 9:45 A.M. boat at San Francisco and arriving at the Woods at 11:45 A.M., where luncheon was served at 12. During the luncheon, Mr. John Werry, of Nevada City, responded to a toast, "The Ladies." Mr. Schade, of Los Angeles, also related some of his experience with the fair sex; and Mr. Parker, of Rockford, Ills., entertained with some of his versatile stories, told in his inimitable way. There were 150 on the outing, not counting "the band." After luncheon, the members and their families spent the afternoon in quiet rambles around the beautiful walks. The trip to Tamalpais is known the world over as one of the most beautiful scenic trips in the country, and the railroad up the incline as the crookedest in the world. Dancing was also indulged in in the afternoon by the younger members of the party. The return trip from the mountain was made at 4:20 P.M., arriving in San Francisco at 6:05 P.M., when the 17th convention of the Pacific Coast Gas Association was brought to a conclusion. As already stated, it was voted one of the most successful meetings ever held; and notwithstanding this, the members who were present from the "Southland" were frank in their statements that the next meeting of the Association, to be held at Los Angeles, Cal., will not only surpass the 17th, but all previous conventions. They have a reputation for doing things down that way; but until that time we will all be from Missouri; and they will have to show us.—B.

Field Notes.

[Prepared for the JOURNAL, by "C."]

Nothing else appeals to the ordinary person more than a clear drawing or illustration; for more information is clearly available at a glance than can be dug out by much time in reading over "logs" or notes. The value to gas companies of having a complete and clear record of all underground work cannot be computed, as the daily experience of many of them testifies. Now, this record is easily made and kept, and entails only the extra expense necessary to purchase note books for main work and printed blanks for services; note books, of a convenient size to carry in the pocket, and sectional-ruled, are best for main work. When full they are numbered and filed for reference, being indexed in a separate book at convenient times, and the records ultimately transferred to a detail map. This simple system makes as complete a record as is ever wanted.

The great trouble with most records is the lack of clearness, due to a lack of attention to detail. Scant space is given the width of the street, the main being usually indicated by a single line. Again, extra space is given to vacant blocks, and much paper used to make a written record, all of which falls short of clearness of a detail drawing.



In plotting mains it is obviously impossible to draw to scale. Make the street as wide as necessary to properly show all the fittings in it, and the blocks, as long or short as may be required for a proper record. In laying a main it may be that some blocks would be all straight pipe, which would not require only an inch in length to illustrate it, whereas the next might have four items or points for record, and would need be about four inches long. It does not matter what the actual length of the blocks are, it is a view of the gas companies' property that we want.

Too much attention cannot be given to detail, and detail is easily recorded in a record like that in the above illustration. A glance shows at once practically all that one wants to know. The grade is shown so that all drippage can be traced. All distances and depths are at once apparent. The styles of all specials are clear enough, so that it is known what will be found when they are dug up for changes or extensions. And the systematic keeping of such records is very easy and inexpensive.

Illuminating Engineering Problems with Gas.

[A paper prepared by Mr. Norman Macbeth, before the Detroit Convention of the Michigan Gas Association.]

Illuminating engineering problems with gas are not materially different from those with electricity; that is, so far as concerns the calculations for predetermined results. An incandescent gas lamp is a "light engine" or "light wave maker," and from the illuminating engineering standpoint is treated exactly the same as any other source, whether the light be from gas, electricity, acetlyene or other form of energy. If this were more fully realized, I believe the gas man would be more apt to apply illumination calculations to practically all problems where the illumination was at all considered, and undoubtedly gas would thereby receive greater recognition as an illuminant.

Owing to the ability of the eye to adapt itself to widely varying intensities of illuminations, we could in the past be assured of an approved installation where 15 to 20 foot candles were applied, although 6 would have been quite as satisfactory. It is just such installations as these which are to day going to tungsten and enabling electricity to meet gas competition on an equal cost basis. With an illumination of 5 to 6 foot candles, which comes under the heading of brilliant illumination, the gas man may figure with the same certainty as his electrical competitor.

I have before stated that, with gas at $1 per 1,000, your competitor must put out free renewals of tungsten lamps and 4 cents per kw. hour electricity, or, with free renewals and 10-cent electricity, your gas is worth $2.50 per 1,000 to compete on the basis of equal illumination. A consumer furnishing his renewals does so at a cost ranging from 1 to 3 cents per kw. hour additional, which in many instances is equivalent to a 50 per cent. increase in net charges.

By far the most simple method of calculation of illumination, and one which is at the same time quite as exact as those methods of greater length and complexity, is that by the use of factors based on the cubic feet of gas per hour per square foot of area to be illuminated. These factors are, of course, based on past performances in actual installations, from observations, physical and illuminometer measurements, with average good quality gas, medinm, but not high pressure, and average adjustment of lamps, installations receiving the usual maintenance service.

The correct way to state these factors is, of course, on the basis of "lumens per cubic foot," or "cubic feet per foot candle per square foot." To render these factors more useful, however, they are given in terms of "cubic feet of gas per square foot" and the reciprocal of that factor "square feet of area to be illuminated per cubic foot of gas" for intensities varying from that required for good illumination to that required for brilliant illumination.

Light Units.	Factors. Cubic Feet of Gas per Hour per Square Foot. A.	B.	Factors. Square feet of Area to be Illuminated per Cubic Foot of Gas per Hour. C.	D.
Reflex lamps rated at 3½ cubic feet per hour with clear Welsbach Holophane reflectors; mantles 8 to 15 feet above the floor.	0.03	to 0.06	17 to 33	
Reflex lamps rated at 3½ cubic feet per hour with sand blasted ball globes; mantles 7 to 10 feet above floor	0.035	to 0.07	14 to 29	
Reflex 4-mantle cluster lamps rated at 13 cubic feet per hour with alabaster globes; mantles 8 to 12 feet above floor	0.04	to 0.08	13 to 25	
Upright 4-mantle arc lamps rated at 20 cubic feet per hour with alabaster globes only; mantles 7 to 9 feet above floor	0.05	to 0.1	10 to 20	
Upright 4-mantle arc lamps rated at 20 cubic feet per hour with alabaster globes and opal reflectors; mantles 7½ to 9½ feet above floor	0.045	to 0.09	11 to 22	

Note.—Column A and D are for good general illumination; column B and C are for brilliant illumination. For low intensities such as are desired in warehouses, piers and locations where only sufficient illumination is required for the discernment of large objects, use ½ of the values in column A or 4 times the factors in column D. These factors are for light ceiling and light walls. With dark walls add 25 per cent. to factors A and B or deduct 20 per cent. from factors C and D.

The use of the factors in the above table will result in equal illumination at a less cost, with gas at $1 per 1,000 cubic feet, than can be obtained with electricity at 10 cents per kw. hour, using tungsten lamps and prismatic reflectors. With ordinary experience in placing lamps, no one need hesitate to use these tables in the laying out of that class of installations which are the largest percentage of commercial work.

Believing that an application of these factors to completed installations would result in a clearer conception of their use than the simple outlining of rules, which at best are rarely sufficiently broad to cover the varied conditions met with in actual practice, 3 problems will be treated at some length.

A section of the Steeplechase Pier" is shown by plan, Fig. 1, and

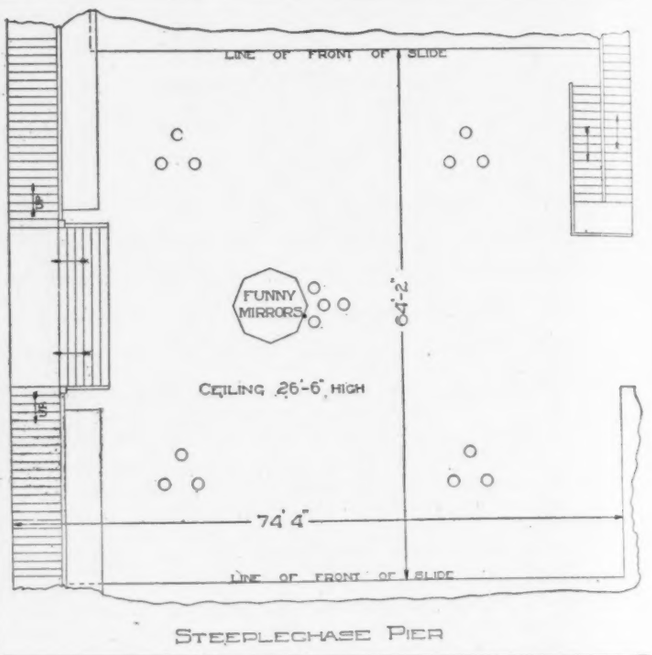


Fig. 1.

photographs, Figs. 2 and 3. This Pier is the only one in Atlantic City

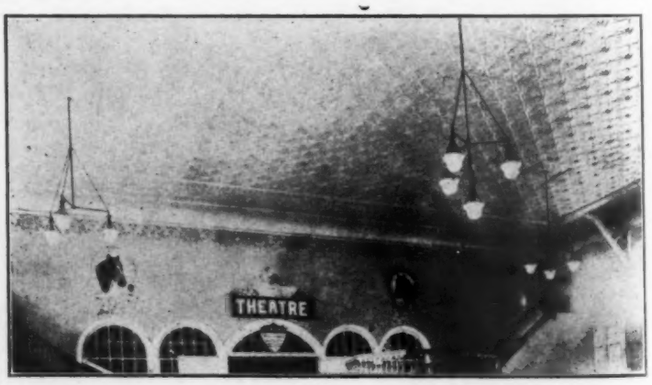


Fig. 2.

containing mechanical amusements. The main room here shown was formerly a dance hall, but is now used as a lobby to the theater and as a play room for the children, both young and grown-up. In addition to the "Funny Mirrors," shown in the center, many freak mechanical pieces are placed about the floor and walls, as is usual in amusement places of this kind.

The room proper measures approximately 64 feet by 74 feet, with a ceiling 26 feet 6 inches high, and the fixture problem should be treated in a manner in keeping with the surroundings. Small lamps could not well be used, and there are at present no lamps of sufficient size to be used singly on the outlets which were already in place and were otherwise satisfactory. General illumination, of good but not brilliant intensity, was desired, and it was decided that fixtures using the 4 inverted mantle cluster lamps would result in a satisfactory arrangement. The white metal ceiling and light walls fix the classification for the factors as given in the table.

On referring to this table, for Reflex cluster lamps, we have a factor of 0.04 cubic feet of gas per square foot (Column A), or 25 square feet per cubic foot of gas (Column D). The area to be illumi-

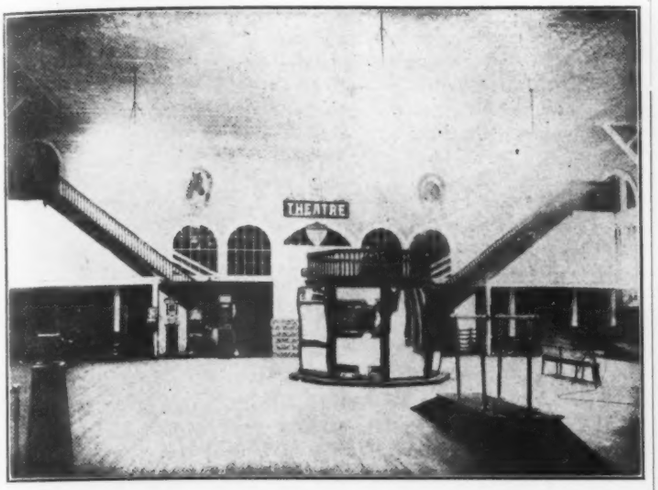


Fig. 3.

Fig. 5.

inated, 64 times 74, equals 4,736 square feet; 4,736 times 0.04 equals 189.44 cubic feet of gas required. The same result would be obtained by dividing 4,736 by 25, the factor by which you may divide the total area to determine the cubic feet of gas; 189.44 divided by 13 (the consumption per lamp) gives 14.57 lamps, or in round numbers 15 lamps. On reference to plan and photographs, it will be noted that 5 outlets were originally provided. This would require 3 lamps per fixture. A fourth lamp was added to the central fixture to contribute to the appearance of the installation as a whole.

On referenee to the photographs, the pleasing relative proportion of the fixtures and room may be noted. The length of the fixture stem, which is of ¾ inch iron pipe, is 6 feet 5 inches; the arms are of ½-inch iron pipe 30 inches long, supported by chains from the stem to the outer ends, from which are suspended regular 4-mantle cluster lamps with standard alabaster globes. This brings the mantles at a height of 18 feet above the floor. Fig. 2 is a daylight photograph, while Fig. 3 was taken at night, showing the much more even distribution of light on the walls and ceiling.

This installation has been much commented upon by visitors from other cities and has been extremely satisfactory to the management of this pier.

Referring to plan Fig. 4 and photograph of interior Fig. 5, we have

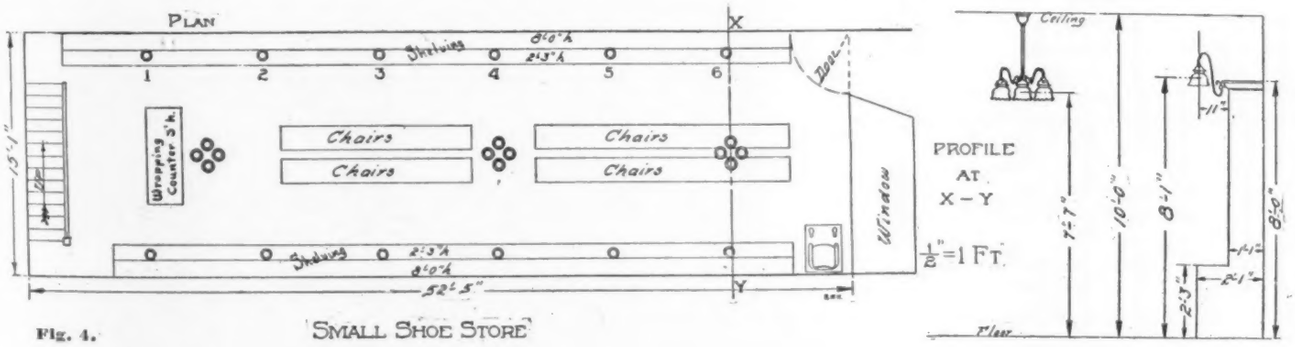


Fig. 4. SMALL SHOE STORE

satisfactory. The bracket outlets are rather close together, and the use of bracket outlets 1, 3 and 5 on each side, together with the central outlets, would be quite sufficient, omitting outlets 2, 4 and 6. In a store having a higher ceiling, bracket lights would not be necessary, as quite as satisfactory an arrangement could be secured, using the central outlets only, with the mantles at a height of 10 feet; or if, instead of the prismatic reflectors, sand-blasted balls had been acceptable, the central outlets alone would have been sufficient.

With a requirement of 12 lamps, using 6 brackets, leaves 2 lamps for each of the 3 central outlets. This you will note is exactly half the number of lamps installed, and is actually all that is ordinarily

an installation of entirely different character. In this instance, the illumination must be of sufficient intensity to permit of close examination of dark leathers and materials, and an intensity designated as brilliant would be desirable.

The dimensions of this store are: Length, 52 feet 5 inches; width, 15 feet 1 inch; width between upper shelving, 13 feet 1 inch; height of ceiling, 10 feet. The ceiling is light and the walls, considering the box fronts, may also be classed as light. The area between shelving is 52 feet 5 inches times 13 feet 1 inch, equals 685.5 square feet. With Reflex lamps and prismatic reflectors, the factor to be used is 0.06 (Column B). Multiplying 685.5 by 0.06 gives 41.14 cubic feet of gas per hour for the entire floor. This amount, divided by 3½, the consumption of one lamp, gives 12.3 lamps.

The ceiling outlets are placed 14 feet 7 inches and 18 feet 3 inches apart respectively, with the distance from front ontlet to front wall about half the distance between outlets. This arrangement would be in use. With these 12 lamps the store appears exceptionally well lighted, and from illuminometer measurements taken was found to have an average intensity of 4¼ foot candles. With all the lamps on, the illumination was as high as 14 foot candles on a plane 10 inches above the floor. It may be noted, however, that this increase was not fully appreciated by the eye; that is to say, the difference between the brilliant results with 12 lamps in use and the effect with 24, did not appear to warrant the additional expenditure.

On plan, Fig. 6, and photograph, Fig. 7, is shown a shoe store somewhat larger and catering to a somewhat different class of trade than the one just covered. The dimensions of this store are: Length, 62 feet 10 inches, to box fronts in the rear; width, 21 feet 5 inches between front of shelving; and the height of the ceiling, 16 feet 1 inch; ceiling, light buff; walls and box fronts, light green. A balcony extends on both sides and the rear of the store at a height of 7 feet from the floor, and 8 feet 8 inches below the ceiling. In the rear of the

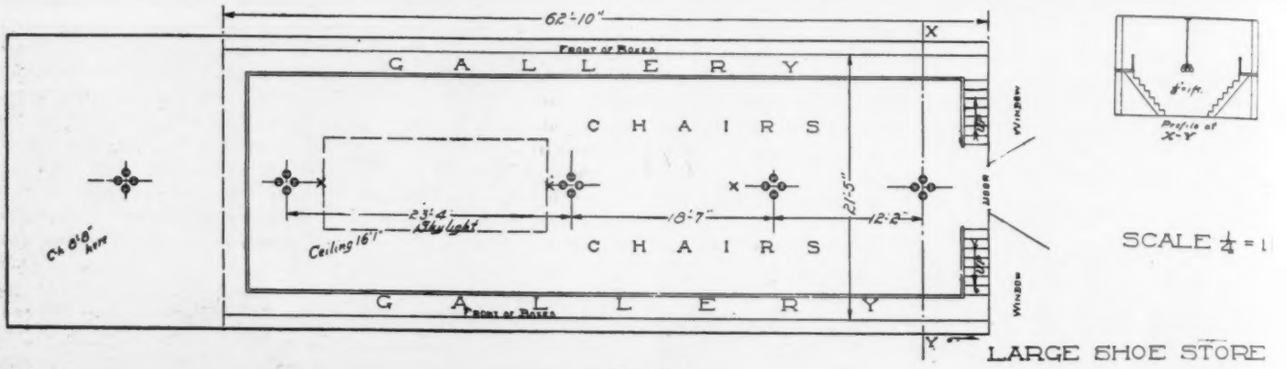


Fig. 6.

Fig. 7.

store a space about 18 feet deep, on both the ground floor and balcony, is used for stock and will not be considered at this time.

Considered as a problem, the illumination of this store can be effected satisfactorily from the central outlets, although, because of the width, it is necessary to use a unit having a wide distribution; this is further necessary as light is required on the walls from the floor to the ceiling. The balcony really determines the height at which the lamps must be placed, as lamps at a greater height than shown would result in a heavy shadow being cast upon the top rows of boxes on the shelves below the balcony. This may be noted by reference to the profile section on bottom of Fig. 6.

The distribution of light from a Reflex lamp, equipped with a sand-blasted ball, is quite wide and is particularly adapted to covering comparatively large areas when the lamps are hung low, and with comparatively high values on the horizontal, and over 35 per cent. of the light directed towards the upper hemisphere, sufficient light upon the upper shelving is assured.

The area, 62 feet 5 inches by 21 feet 5 inches, is 1,350 square feet. Applying the factor for this equipment 0.04 (area times factor) gives 54 cubic feet per hour. This, with 3½ cubic feet per lamp, gives 16.2 lamps. With 4 outlets, which are spaced as shown on plan, a fairly uniform result can be obtained by using 4 lamps per fixture. The illumination could be rendered more uniform by moving the second, third and fourth outlets to the locations indicated on the plan by the heavy crosses. As above stated, the height of these lamps, 9 feet 3 inches to center of mantles, was determined by the height of the balcony.

The resultant illumination from this layout has been checked up with an illuminometer in front of the two lines of chairs and found very uniform. The general effect, with the evenly illuminated box fronts extending to the ceiling, is good, the average intensity on the box fronts being slightly in excess of 1½ foot candles, while the mean intensity throughout the room, on a plane 30 inches high, was 2.6 foot candles.

The photograph, Fig. 7, was a daylight exposure, while Fig. 5 was taken at night. In comparison, Fig. 5 is much more satisfactory. Interior photographs with daylight are rarely good owing to the strong direct light (which it is difficult to avoid) from windows, doors or skylights. For the general solution of illumination problems using the tables given above, an approximate plan of the room or area under consideration should be taken, not omitting any galleries or irregular sections, height of ceilings, position of present outlets, if any, and color of walls and ceiling.

Take the area to be illuminated, and if same is irregular, it may be divided into a number of sections, treating each one independently. The same method admits of giving any particular section or sections an individual treatment—increased or reduced intensities—according to the character of the goods displayed or the purpose for which the illumination is desired. As a matter of fact, practically all large installations are but a combined number of smaller ones, and can only be handled in this way.

Multiply the length by the width to obtain the area. Multiply the area by the factor from Column A or B of the table, corresponding to the unit selected, to obtain the total consumption. Divide the total consumption by the rated consumption per unit (see table) to obtain the number of units. The proper placing of the units thus determined upon is largely a matter of experience and judgment.

Regarding the question of the height at which to hang lamps, much has been said, not all of which is along the lines agreed upon by either the gas man or his consumer. Lamps with inverted mantles should be placed considerably higher than has been customary for lamps with upright mantles. It is generally conceded, and can be readily proven, that upright mantle arcs 6 feet above the working or effective plane are hung at the proper height, both as to the illumination on the floor and the ceiling; that the gas man working on commonsense lines, aided by years of experience, was right in placing these lamps at this height. It can be just as readily demonstrated that lamps with inverted mantles should be hung at greater height, and for the same reasons.

This is shown graphically on Fig. 8. The arc lamps hung at 6 feet

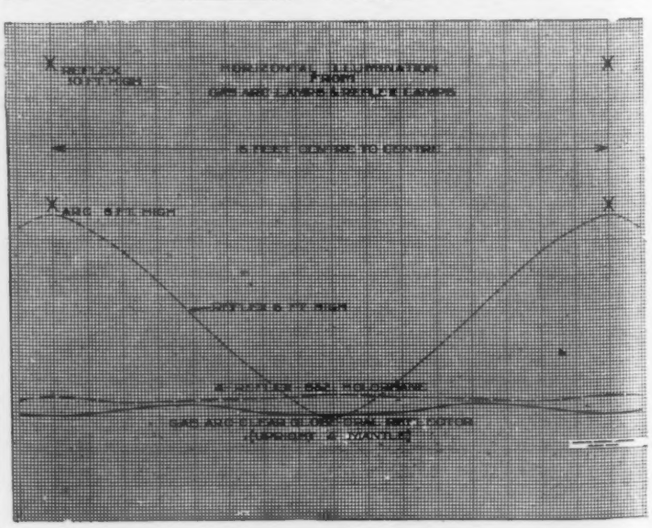


Fig. 8.

above the plane, at distances 16 feet apart, give practically uniform illumination. The same uniformity of illumination, with slightly higher intensity, is obtained by hanging, on similarly spaced outlets, 4 Reflex lamps equipped with prismatic reflectors, but at a height of

10 feet above the plane, or 4 feet higher from mantle centers than are the arc lamps.

The illumination curve showing the extreme lack of uniformity—the illumination midway between fixtures being less than one-third of that given directly below—shows the results from hanging the Reflex lamps at the wrong height for these lamps, although this point is the right height for the arcs.

Attention to just such points as outlined in the above problems will do much towards insuring better results. Slightly more time may be required at first in handling installations in this way, and the average gas man is liable to feel that the old way is best, at any rate, it is easier. That may be so, but these are not the "old days" and the gas man must keep up or fall behind. The enormous amount of publicity and advertising of your chief competitor, together with the attention he is giving to the cause of better illumination, practically compels you to get out on the firing line, or retire to the trenches with the half-masted standard, "Cook with Gas" as a temporary consolation.

The tungsten lamp situation, which is not without interest to the aggressive gas man, has not been by any means settled. The central stations have, of ceurse, largely adopted them, but rarely to a greater extent than that necessary to afford a club to keep the contractor out of the business, that they may control the installation of these lamps, and to as great an extent as possible limit their introduction to the larger sizes. The idea is to install the tungsten lamps, not on the basis of same illumination as previously used, for one-third the amount paid, but to give the consumer three times the illumination for the same money plus lamp renewals. This brings up a point which has been little understood. The use of electric service with arc lamps and carbon filament lamps has been gauged mostly by what a consumer felt he could afford to pay for the service. This amount of service has rarely been in any sense a liberal one; further, many central stations, with differential systems of charge based on maximum demand, load factor and minimum charges (monthly or yearly), have worked out and proven the amounts which the average consumer may be brought to pay for the minimum service.

The result is that, with the adoption of the tungsten lamp, consumers of electricity are generally paying more than before for their lighting service. In this way, installations made by the central station, on the basis of equivalent energy, require the consumer to pay for an equal consumption to that formerly required for the arc lamps or carbon filament lamps used for a similar number of hours per day; this hour's use was undoubtedly at a minimum, as the older lamps were too costly for electricity to admit of willful waste; now, in addition to these electricity costs, the consumer is compelled to pay for his lamps. This is most unsatisfactory to many consumers. I have known electric consumers of a size contributing $500 to $3,000 per year, having had free carbon renewals for years, and accustomed, therefore, to consider their electricity costs only, figuratively "go up in the air" on the burning out of a tungsten lamp costing perhaps $1, when, as a matter of fact, that particular lamp may have had a life of 1,500 hours to its credit.

Many gas men recall similiar indignation on the part of gas consumers in the early days of incandescent mantles, when the mantles were fragile and expensive; the dissatisfaction was often there even after you had shown your customer that he had actually saved in gas costs eeveral times the price of that particular mantle. In the sale of illumination, either gas or electric, the satisfying of a customer is the rock, first and last, on which either system may be wrecked or find success.

I believe I am quoting Mr. Searle, of the Rochester (N.Y.) Railway and Light Company, correctly, in a statement made at the recent N. E. L. A. convention, at Atlantic City, to the effect that "Consumers have just so much money to spend and they want light. Consumers go to gas because they have been able to get more light for tLeir money." Mr. Searle was a gas man, but is not by any means outside the fold when the sale of electricity for illumination is a possibility.

In the sale of gas illumination, the question of electric rates should be fully and carefully studied. Your solicitors dare not make representations regarding combined gas and electric costs without a clear knowledge of the rates on which these costs are based. Salesmen of lamps, having a higher efficiency than the carbon filament lamps, have had this condition to contend with for years, and lately many cases are coming to light where any lamps more efficient than the free renewal carbon filament lamp, if purchased by the consumer, would be an expense and not an investment. I might mention three cases in as many different Eastern cities. A large consumer, purchasing current on a fixed cost per kw. of demand per year, plus running costs, of 5, 3 and 2½ cents per kw. hour, changed over his installation from carbon filament and arc lamps, all of which were, by-the-way, owned and maintained by the central station, to tungsten lamps. A good installation made with increased intensities throughout, the windows in particular being much improved. The net reduction in demand was, however, about 50 per cent. That firm's bills for lighting are higher now than before, with the added irritation of high lamp renewal costs. The fixed costs are determined by "the greatest reading of an indicator between November 1st and the following February 1st of each year," and as the change from arc lamps to tungsten was not completed until April 1st, the rates of charge remain on the basis of the old, inefficient installation until February 1st, 1910, unless this particular consumer can be persuaded to wipe out his fixture investment after 6 months' use and install gas throughout. The load factor of this consumer would not be different with tungsten lamps than with the old lamps, and the advantage of a satisfied consumer (for what consumer would not be satisfied with better illumination at less cost?) and the good advertising resulting from same, in this instance, are lost to the company, whose rates of charge are on so "scientific" a basis that they retain the same income, whether the consumer uses efficient or wasteful methods of transforming their energy into what is the only concern of merchants generally—good illumination.

Another case is that of a large dru g store using considerable artificial light during the daytime, and the full load capacity from sundown to midnight every night in the year, resulting in a 10-hour per day load factor. This consumer's service with electric arc lamps, costs 6 cents per kw. hour and should go in there and install sufficient gas to cut the electrical installation and corresponding monthly consumption 40 per cent., the net costs for electricity would not change $1 per month and your consumer would have his gas costs as an added burden. Now this is not a cleverly designed rate to keep gas out and place a premium on the exclusive use of electricity. This rate would result in approximately the same current charges if tungsten lamps were installed, plus the cost for the lamps. In both the above cities, the companies are under the supervision of public service commissions.

In another city, with entirely different contract conditions, a consumer discontinued the use of gas for illumination on 8 upright mantle arcs and nearly 50 upright burners, benefiting to the extent of the amount of gas taken by these lamps, and in addition to receiving the electric lamps and energy for this replacement free, the total yearly electric cost was reduced by over $500.

It is a poor rule that won't work both ways, and one of our prominent members in this Association has to his credit the increasing of the monthly consumption to one consumer, from 95,000 cubic feet to 225,000 cubic feet, by the installation of incandescent gas lamps for illumination, where formerly electric lamps were used with electricity charges at less than 2 cents (actually 1.69c.) per kw. hour. Business of this character can only be secured and held, when you are armed with a thorough knowledge of the kinks and possibilities of the contract rates of your competitor.

Attention must be given to lamps and their placement, if gas is to continue to hold the vantage point, which is its due, and to which it is most rightfully entitled. With the open flame and many of the upright combinations, because of poor distribution and not because of the quantity of light which may be generated in terms of mean spherical candle power for 1 cent., electricity with the newer high efficiency lamps may and does compete on a favorable cost basis. That is the costs for carefully designed electric installations are not prohibitively higher than these consumers have paid for extravagantly and wastefully planned gas illumination.

It would be well at this point to insert two quotations from recent publications. [1] "In a city with active gas competition it is necessary in order to compete with gas, to give the customers the most economical installation possible, and we find it advantageous to recommend a 25 or 40-watt (tungsten) lamp, if either of these will give sufficient light for a particular purpose, rather than to recommend a 100-watt lamp, and give the customer three or four times as much light as he needs;" and [2] "A point that should be carefully attended to by t' e Central Station in advising the lay-out of an electric light installation for a store that has previously been using gas, is to see

1. J. C. Rothery, "Selling Electricity," August, '09, page 48.
2. The N. E. L. A. Electrical Solicitors' Handbook," see "Illuminating Engineer," August, 09, page 337.

and also to insist that for the first 3 months or so the storekeeper only gets light which is comparable, [1](in cost). With his former gas illumination; this will make him satisfied with his bills. Afterwards, when he sees how much better lighted other stores are and wishes to increase his own lighting, as he is sure to do, he will appreciate the fact that his electric bills are greater in amount that his former gas bills, not because electric energy is an expensive luxury, as some misinformed people erroneously say and think, but because he is using so much more light."

Although slightly at variance with the above quotations, in order that you may more thoroughly get an understanding of your competitors' estimation of your product, I insert the following paragraph copied from the "Handbook" above mentioned. "Where actual figures are not propounded, it is often airily stated that 'it is a matter of common knowledge that gas is cheaper than electric light;' it might be more accurately styled a 'matter of common ignorance.' It is one of those convictions which the evidence of annual accounts will alone dispel."

Gas men are very frequently cautioned by the electrical press to play fair, and to stick to what they consider favorable figures when making comparisons. Lamp comparisons are to be made only when the electric lamps are equipped with the most efficient light distributors available, though but a small percentage of such lamps in actual use may be so equipped; also, when discussing light output from electric incandescent lamps vs. gas incandescent lamps, to bear in mind that mantles depreciate with life. Of course, they do, but the fact that many of the electric incandescents have ceased to be useful after 300 to 500 hours, does not warrant a comparison being made on the basis of initial or laboratory performance of the electric vs. gas incandescent mantles after 1,000 hours of life, nor is the renewing of mantles each 150 hours warranted by common practice, although same was evidently necessary in a very elaborate cost table given recently on "Incandescent Gas Light vs. Tungsten," in one of the highest rated electrical manufacturers' trade publications.

Just as constant dropping will wear the stone, so is the public being affected by this "matter of common ignorance." The proof is in your hands and is, as stated in the last line of the paragraph above quoted and here repeated, "It is one of those convictions which the evidence of annual accounts alone will dispell."

Gas for illumination is inexpensive; there is no doubt about it. Evidence in abundance can be secured from annual accounts, showing that a good, incandescent gas installation is just as far ahead of a similar, up to-date electric installation in maintenance costs, as the older methods were ahead of the older electric systems.

The small shoe store shown pays $4 to $5 per month, for the exceedingly brilliant results secured. In the large shoe store, the former costs for electricity were $700 per year. Electricity is still used in the windows to the extent of $150 per year; the entire costs on the interior, however, do not exceed $75 per year. Whether the gas man has hesitated to use these annual cost figures, deeming them too insignificant, is not evident.

That architects, acting for owners who build to rent or sell, are having houses and apartments wired for electric service, and have omitted the piping for gas, aside from a service for cooking and possibly a bracket light in the kitchen and one in the bathroom, seems to be amply proven by observation. In view of all the conditions, it is inconceivable that gas companies should permit this situation to continue, especially in residence and apartment house work. I am informed that in many cities as high as 75 per cent. of these buildings are equipped for electric light only. If the purchasers knew that they would later have the expense and inconvenience of having their houses piped for gas, they would be more likely to insist that this necessity be attended to at the time the building is under construction.

Recently, in conversation with the owner of a wholesale notion establishment in a Southern city, he informed me that he had seriously considered installing electricity instead of gas. He was one of those consumers who figure close, so close that he would not subscribe to maintenance service on the many arc lamps installed on the 5 floors and basement of his building. The building was 30 feet wide by 120 feet deep. The basement is used for a shipping room and was lighted all day, with upright mantle arcs. He had not gone ahead with the change as the estimate for wiring amounted to $1,500. On inquiry as to the present costs for gas he stated that they amounted to nearly $300 per year, and he said it with about the same expression and tone that you would expect had the amount been $3,000.

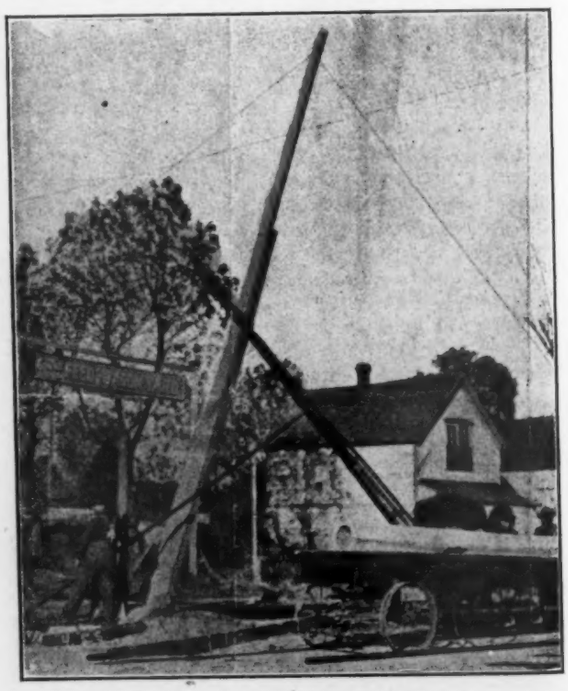
You can afford in figuring against competition to give more attention to wiring expense. It is invariably greater than the costs for good pipe work, and now that conduit is required in many locations, is losing the advantage previously held.

Moving a lamp or changing the position of an outlet by the substitution of a longer wire, a couple of knobs or cleats, and a few minutes' work, is now rarely permissible. This simple operation today may spoil a day's time for a mechanic and helper, and require the presence of an inspector and in some cities too, with the usual fees. Next year these inspectors may require changes in the work which last year was approved. The inspectors are, of course, invariably in the right, as lives and property are too valuable to permit unsafe wiring to place either in jeopardy.

1. These two words "in cost" I insert, deeming them necessary to clear the meaning in the text following.

Concrete Poles on a Gas Works.

At the last meeting of the Oklahoma (Okla.) Light, Railway and Gas Association, Mr. J. M. Brown, Superintendent of the Oklahoma City Gas and Electric Company, read a paper in which he recounted his experiments in the past year with constructing reinforced concrete poles, which experimenting was done on a fairly large scale. The poles are hexagonal in shape and hollow in the center. A 35-inch pole was 7 inches across the corners at the top, and 16 inches across at the butt, and the forms are so arranged that, by adding sections 5 feet long to either end, the poles can be made of any desired length. The forms are made of heavy timber, to avoid warping, and are built in two halves, which are clamped together and accurately lined up to measure that the poles shall be straight. The 12½-inch, high carbon steel of retrussed suction reinforcing rods are then put in place symmetrically about the central axis. At the top of the pole the rods are



secured by passing them about 2 inches through holes in a steel plate, bending over the ends and then bolting down a second plate on the bent-over ends with 4 small bolts. The rods are then stretched and anchored in the butt by an ingenious method. The ends of the rods project about 6 inches through holes in a steel plate fastened in the form. Pieces of ¼-inch steel rod 10 inches long, with an eye formed in one end and threads on the other end, are used for stretching. The ends of the reinforcing rods are bent over and hooked into the eyes of the stretchers, and short pieces of pipe are passed over the stretchers butting against the steel plate. A nut and washer bearing on the outer end of the piece of pipe is screwed down on the threaded end of the stretcher, giving any desired tension to the rods. The form is then ready for placing the core, which is made in two sections, telescoping with each other. The core is wrapped with one thickness of building paper and is hung in the center of the mold by suspension wires placed at intervals along the lenghth of the form.

The concrete used consists of a mixture of 1 part cement, 2 parts and 3 parts chats and zinc tailings, which can be obtained in large quantities from the zinc mines of southwestern Missouri. With cement costing $1.50 per barrel, sand at $2 per cubic yard, chats at $2 per cubic yard, and labor $2 per day of 8 hours, the cost of manufacturing a 35-foot pole, 7 inches across at the top, averages $10. Three men can make 3 poles per day. Poles have been molded, hauled 3½ miles and set in 5 days' time, but this requires very careful handling and a longer time should be allowed for the concrete to set thoroughly. A 35-foot pole, molded, hauled to place and set, with steel cross-arms and pins, mounted ready for stringing wires, costs $18.

The advantages claimed for concrete poles are numerous. They are more rigid than wooden poles and wires do not swing as much as when mounted on wooden poles. The maintenance cost is practically negligible and the depreciation far less than for wooden or steel pole lines, as they do not rot or rust. They resist lightning discharges and accidental grounds, can be erected with no more trouble than wooden or steel poles, and can be climbed for inspection or repairs as easily as a steel pole.

Northern Lights.

[Communicated by "R."]

While the discovery of the North Pole seemingly should make but little difference in the routine work of the gas lighting engineer, in reality quite an important movement is in view that is traceable thereto. The advertisers of the country are never slow in introducing catchy mechanical systems of advertising, and storekeepers are always on the lookout for something interesting to put forth in connection with the display of goods on sale. The hostess of the country home especially is constantly striving to evolve something out of the ordinary run to interest her guests. In fact, people in general are more or less concerned in the application of a new idea to practical service than is usually supposed. For illustration, certain merchants are obtaining increased revenue from the sales of their goods because they have arranged with certain flying machine engineers to make the starting point of their flying trips from the store of the merchant. Sometimes a model of a flying machine is placed in the show window to attract the observation of the public, and business is improved within the store as a result.

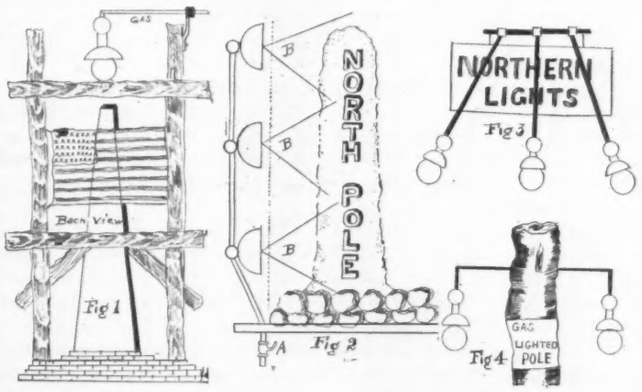
Consequently, since the awaking of the lively interest in the North Pole of late, gas lighting engineers have been called upon to install systems of gas lighting in connection with North Pole exhibitions. Fig. I is an illustration of one form of north pole lighting employed. It is a rear view. The structure of boards is erected on the flooring of the front show window, and the framework serves to support the goods intended for display, while the northern light effect is upon the North Pole in the middle. The rough boards are covered with the goods.

In the center of the affair is the representation of the North Pole. It may be a spire of marble or of common wood framework, covered with white paper or white cloth, and the spire may be a rounded tree-trunk or a timber properly planed down. No one knows just what the design of pole should be, but the legend infers a pole of some sort. Then, of course, the American flag must be shown in connection therewith. The flag may be strung to the pole, or it may be stretched across the frame as in the cut, for the purpose of deriving some colored northern lighting effects with the gas lights and tinted gelatine or glass. Then the light proper is situated above, in the center, where the arc lamp can cast a strong ray below over the goods exhibited and the pole. The bright light glimmering on the white pole will attract the notice of persons. The installation of the gas arc concerns the gas lighting engineer; the other work may be done by other artisans; or the whole scheme may be engineered by the lighting men. Often the contract of this character is taken by the lighting mechanics, and the details of framework sub-let to woodworking artisans. This would be the case in the event that a number of structures of common pattern were needed. Sometimes a big merchant will place the order for kindred window design mechanisms for his circuit of stores. The lighting of the gas arc in this combination involves simply tapping the gas line near the frame for the fixing of the lamp as shown. It may be that the lamp is already there; in fact, perhaps only a joint or two of pipe will be needed to complete the connection.

In some instances the pole only will be used and the gas lighting machinist may be required to so place lamps as to get proper reflection on all sides. A pole thus installed is shown in Fig. 2, in which the dotted line at the left represents the cut-off point where the shade or partition exists. The 3 gas arc lamps being behind this shade are not seen by the persons in front. The strong light is poured in upon the sides of the pole. A kindred setting of lights is used for the opposite side. The throw of the lights is marked *B*. The inlet of gas main is at *A*, below the floor.

Fig. 3 represents still another combination. The three gas arc lamps are fixed to projecting arms, as shown. The lights are arranged back of alternating, colored sliding glasses. A lad is required to move the slides. The slides are like the slides of the stereopticon, and a miniature spot light fixture, lighted with a gas arc flame, should be used. The goods for exhibition are placed among arctic scenery, such as painted blocks for icebergs and flour for snow. There should be a home made arctic sled and a few toy dogs and natives. The boy at the spot light can proceed to cast tinted shadows over the scene with very good results.

Again, the simple gas lighted pole, Fig. 4, placed in a gas light



distributing office, attracted attention because the masses are reading about and talking about the North Pole in these times.

The application of gas lights to the models of North Poles is not restricted to show window advertising as before stated,

Remarkable gas lighted pole exhibitions may be located in homes and offices. The schools of instruction employ the same for educational purposes, for the pole fever is with the school children, too. The man who has his fads of automobile, flying machine and like models, on the table of his den at home, now has a North Pole specimen there too—in some cases a working model with northern lights, and he tries to explain to friends how either Peary or Cook, or both, did it all.

New Business Methods.

[Prepared for the Seventeenth Meeting of the Pacific Coast Gas Association, by MR. T. D. PETCH.]

Before proceeding with the subject of this paper I desire to call the attention of the Association to the interesting fact that this year (1909) is practically the 100 period of the application of F. A. Winsor to Parliament for a franchise, or charter, from the British Government, for articles of incorporation for the Chartered Gas Company, of London, which Company not only enjoys the distinction of being the first company incorporated, but is to-day, I think, the largest gas company in the world, known as The Gas Light and Coke Company, of London, England.

Winsor was bitterly opposed before Parliament, by William Murdock, to whom undoubtedly belongs the honor of the first application of coal gas for lighting purposes. As early as 1792, Murdock began experimenting with the different kinds of coal, wood and other substances, by destructive distillation, for the purpose of making gas, and in 1797 built and operated the first gas works, with which he lit his own premises. With this brief mention of the early history of our industry, I will pass to the subject of this paper.

A few years ago the writer was, and had been for some years past, manager for a company operating both the gas and electrical departments of the lighting business, in a town of 12,000 inhabitants. The lighting of the entire town had gone over to electric, and it seemed as if the gas department had outlived its usefulness. With gas selling at $3 per 1,000, and wood at $2 a wagon load, the annual output was 3,000,000 cubic feet. About this time crude oil had com-

menced to be produced in the southern end of this State, and oil gas generators had begun to take the place of coal gas retorts.

I was fortunate in having as President of our Company a man who understood the business. He was thoroughly progressive and not afraid to spend money for improvements, if he thought such expenditure would bring results. After taking the matter into consideration, an oil gas generator was installed, the price of gas reduced to $2, a small stock of gas ranges, water heaters and other kinds of appliances were put on sale by the company with indifferent results.

Six months later the methods that increased our sales, in a little over 2 years, from 3 to 18,000,000 were put in force. The price was reduced to $1.50 per 1,000, base rate, but in reality to $1 per 1,000, and I can assure you that such a radical measure was not adopted without some fear of what the result might be. I believed then, as I do now, that the $1 mark must be reached by any company before the maximum of sales could be obtained. But to explain what I meant in reality, $1 gas. We advertised that the rate for gas had been reduced to $1.50 per 1,000, but any customer paying $3 or over per month would be charged at the rate of $1 instead of $1.50.

As we expected, it very often happened under this arrangement that two people would pay the same amount, $3, one for 2,000, the other for 3,000. We were particular to explain to the customer paying the $1.50 rate for 2,000 cubic feet that he could have used 1,000 feet more, with no extra cost to him, and in nearly every case we found our customer the next month had used between 3,000 and 4,000 feet, and was pleased that he did not need to study close economy in the use of his appliances.

The next move was to purchase 50 of the cheapest good gas ranges, as well as to stock up our appliance department with an up-to-date supply of ranges, water heaters, radiators, tailor irons, toasters, nursery burners; in fact, anything in the appliance line that we thought might be called for by our customers.

At this time, as far as we were able to ascertain, there were only 20 fuel gas appliances in the town connected, and we came to the conclusion that, if we succeeded in increasing our gas sales, something out of the ordinary must be d ne to induce people to use gas for fuel purposes. So we inserted an "ad." in the daily papers to the effect that the first 50 people applying at our office, and agreeing to use $2 worth of gas per month for the period of 1 year, we would, at our expense, connect up a new gas range in their kitchens, ready for use, absolutely free of cost to the party signing the agreement. In 10 days every one of the fifty stoves were signed for, and we could have had as many more. It is worthy of note that, for the signed-for period of 1 year, only four of these free stoves were removed, and every one of them eventually paid the $1 rate, using 3,000 feet per month at least. As an advertising medium these free stoves brought quicker and better results than anything in the "ad." line I have ever tried.

Our appliance department was placed in charge of a lady demonstrator; a salesman and solicitor were sent out to make a house-to-house canvas of the town. And to the zealous and enthusiastic work of these two I attribute the sale of nearly 2,000 appliances in 2 years. In every case, after the first 50 stoves were set, all appliances were sold at cost, with free service and connection, besides running a little over 8 miles of main.

I have not attempted to go into close details, but have given the main points only, which brought about in a small town a large increase in gas sales, in a comparatively short time, under the conditions stated, which may perhaps be considered out of the ordinary.

With your permission I will now consider the methods employed quite recently in another is 12,000 population town, existing conditions about average for a Californian small town. Early in the winter it was decided to make an effort for new gas business the following summer.

The first thing done was to send out a reliable man, with instructions to carefully note each house by street and number, located on the company's mains, segregated in three divisions; the first division to give the existing consumers; the second, premises having service but not being used, designated as dead services; the third, premises not connected by service, and called non-consumers. This data was then transferred to a "Sanborn" map, on which had previously been placed the entire underground system of the company, in different colors, representing different size mains. Each service was then ruled in from the main to the meter in red ink, regardless of whether it was in use or not, but in the case of a dead service a light pencil line was traced from the property line to the front of the house, showing that the service was not in use. Whenever these idle services became active the pencil line was easily erased. Next, typewritten copies of all dead services and non-consumers were carefully made, by street and number, ready for the solicitor. The same record was obtained of every street and house in that portion of the city not covered by mains, these in turn were listed on typewritten copies, ready for future use With this record before us we were in a position to go after new business in a systematic manner, taking up any street in any portion of the city, whenever we thought it could be worked to the best advantage. The next step was to buy out the stock of the three firms carrying gas appliances, and fit up in our office an attractive display of ranges, water heaters, etc., connected and ready for demonstration, particular attention being given to the window display, making it as attractive as possible, with a collection of the best class of ranges and heaters, with few of the smaller appliances, such as hot-plates, waffle irons, etc., not too closely crowded together, but arranged to give the best effect. The window was left well lighted until 10:30 P.M. The writer usually returned to the office about 7 o'clock in the evening, and remained until 9:30, sometimes later. Judging from the number of people who stopped and looked at the appliances, as well as those who came into the office to make inquiry, it was a success.

Much depends on the man employed as a solicitor, for the position is often a hard one to fill, requiring, as it does, a thorough knowledge of the apparatus to be sold, ability, natural, not assumed politeness, an all-round genial disposition, and the energy and staying qualities of a 10-horse power gas engine. Add to the above description a firm belief that gas is the only fuel on earth fit to use and you have a true portrait of the one selected from among the employees of the company to do the soliciting. In addition to his regular salary as inspector and trouble man, he was paid 50 cents for each appliance sold or connected for a new consumer and an additional $5 if 50 appliances were set in the current month.

Having been given the street data, previously prepared, he commenced to work that portion of the city in which we had no mains laid, and for 3½ months kept a crew of 20 men busy laying mains, putting in services and setting appliances and meters.

A month later a lady instructor and demonstrator was sent out to follow up the work of the solicitor. This comparatively new addition to the gas company's force, in my opinion, should always be a woman. If she is thoroughly qualified to fill the position she can do more to bring about a friendly relation between the company and its patrons than any other means that can be employed.

To be effective she must possess all the qualifications and abilities of the successful solicitor, must understand and be able to regulate all kinds of gas appliances, be familiar with the correct method of setting ranges and water heaters, know the moment she handles the range its condition, if the pressure is good or bad, etc. She must be an excellent cook, be possessed with patience and tact to a marked degree. She must be a perfect lady, the more refined the better, at home in the parlor or kitchen, of good business ability, a pleasant and persuasive talker. Her business is with the lady of the house, the one who does the cooking, the one who puts up with a hot, dirty coal or wood range, or enjoys the cool, clean health and comfort of the gas range.

Our instructor, in the course of 8 weeks, made a house-to-house canvas of the town, interviewing and instructing whenever necessary in the economical use of the range. Listened to complaints, in some cases rectifying them, and in others returning them to the office, to the complaint man and gasfitter. She also gathered together the complete data for a consumers' card record, showing the name, street, and number of the house of both consumers and non-consumers. In the case of consumers the appliances in use were noted on the card, together with anything of interest, such as prospect later for a water heater, or if the card recorded a hot-plate in use, talked purchase of a range, party interested, follow up with literature and call later. Non-consumers are noted in the same manner.

The size of the meter and service will eventually be recorded on the cards, which, when filled out, will be a complete record of the consumers service from the main to the appliance in use, as well as a good guide to future new business.

The usual means of advertising in the daily papers was carried on, the "ads." being changed as often as necessary, as well as special cards and posters being displayed in the windows and office. The two gas wagons, as well as the electric department wagons, were made to serve the purpose of a travelling advertisement. All these wagons were sent to the paint shop and lettered on one side "Cook with Gas,"

on the other, "Ranges at Cost. Services and Connections Free." The name of the company and office number appeared on the end gate. As these wagons were going all day, the lettering on them attracted more or less attention all over the town.

Another, and the most expensive, method of advertising was the cooking school demonstration, consisting of a series of 6 lectures on scientific and practical cooking with a gas range. A large, vacant store was fitted up for the purpose, and from the first to the last lecture it was hardly possible to get standing room. Seats were provided for 250. The two ladies who gave the lectures were certainly past-mistresses in the art of cooking and ability to lecture on the subject. I am, however, of the opinion that this method, on account of the expense, is better adapted to larger cities than ours.

Another, and not to be overlooked, factor in getting new business is the office force. The treatment afforded the public at the counter helps or retards every effort made for new business. I would like to note at this point that new business is not confined to new consumers, but to the old as well. When consumers have been supplied with what we have termed a gas equipment, consisting of a range, water heater and toaster, and the coal stove out of commission, then only can you let your consumers alone. Don't bore them, but remind them occasionally that they need the appliance they have not got. It is imperative that the public be educated in the use of all kinds of gas burning devices if we are to get the best results. The office force can, by pleasant, courteous, obliging treatment, do much to bring about the desired end, and the reverse, according to the manner they treat people making inquiry or paying bills at the counter.

All of the methods mentioned have proved more or less good aids in procuring new business in the experience of the writer, who is himself perhaps an enthusiast in his belief that gas is the fuel of the people, at least of this State; and all we have to do, as manufacturers and sellers of gas, is to educate them to the fact that gas is the cheapest and best fuel to use from every standpoint. Then, and not till then, will the maximum sales be reached.

[Special Correspondence.—Concluded from page 822.]

THIRD ANNUAL CONVENTION OF THE ILLUMINATING ENGINEERING SOCIETY.

Second Day—Evening Session.

At the evening session the Society was fortunate in having among the members present a gentleman who is also President of the Franklin Institute, of Philadelphia, and past-President of the American Gas Institute, Mr. Walton Clark. He addressed the meeting briefly, congratulating the members on their efforts to conserve not only our natural resources but our eyesight as well.

The only paper of the evening was that presented by Dr C. P. Steinmetz, on the "Physiological Effects of Radiation, Especially Those Outside of the Visible Spectrum." He stated that, in spite of the fact that daylight contained far more of the ultra-violet rays than did artificial illuminators, nevertheless the latter were much more harmful, so that we must look for something besides ultra-violet light as the cause of the trouble.

The troubles to which our eyes are subject, he divided into three classes: Indirect, due to impairment of color distinction; direct, due to the power or quantity of radiation, and specific, due to high frequencies. Regarding the trouble due to the second phase of the question, the Doctor explained that the harm from a 4 W. P. C. lamp was greater than a 2 W. P. C. lamp on account of the greater energy or power outside of the visible spectrum which reached the eye.

The paper was discussed by Messrs. Jones, Bond and Klumpp and Drs. Cobb, Simonini, Hyde, Bell and Elliott.

Automobile Trips.—After the session closed the members journeyed in autos to Riverside Drive to view the "Ryan Scintillator," and from there down through the city over the route taken by the parades, and on to Brooklyn.

A most successful feature of the Convention lay in the fact that New York was illuminated as never before.

On the following morning some 150 guests, of the fair sex, embarked in touring cars on a long trip, not only in New York but Westchester county as well.

Wednesday—Morning Session.

There were no distractions in the way of parades on Wednesday and, with beautiful weather, the attendance was noticeably better. The first paper, on "Allowable Amplitudes and Frequencies of Voltage Fluctuations in Incandescent Lamps," was presented by Mr. H. E. Ives. The matter covered a test made at the Bureau of Standards in Washington, and the data should prove of considerable value.

Mr. Fisher pointed out that a low frequency, such as 25 cycles, was permissible in street lighting where the intensity of illumination was low.

Dr. Sharp said that the sensation of flicker was stronger when we looked at an illuminated object than when we looked at the lamp. Others entering into the discussion were Messrs. Merrill, Hyde and Perkins.

The next paper (by Dr. Louis Bell) was entitled "The Principles of Shades and Reflectors." While it cannot be said that new ideas were brought out, the subject is well worthy of discussion and a most impartial statement of the facts was presented.

Mr. Jones described a metal trough reflector with glass shields for the lamp, which gave practically uniform illumination. The paper was also discussed by Messrs. Wolhauer, Lansingh and Owens. The concluding paper of the morning session was entitled "Standard Relations of Light Distribution," by Mr. A. J. Sweet. This was a most ambitious paper, and the work presented should prove of value to those who are dealing with practical problems of lighting installations.

Mr. Woodwell stated that we should encourage the specialist to take up each separate problem rather than use general rules as suggested by the author. Mr. Hopton thought that the curves shown would give normal values which would be too high for residence lighting, and Mr. Owens said that the reverse was the case with commercial lighting. Mr. Elliott congratulated the author on bringing forward suggestions for standardization, of which the art was badly in need.

Wednesday—Afternoon Session.

The final session was opened with a paper on "The Problem of Heterochromatic Photometry," by Mr. P. S. Millar. Owing to the fact that our modern light sources have such varied color characteristics this subject is one of increasing importance, and the paper should be of considerable assistance to those endeavoring to solve the problem.

Dr. Steinmetz said that the matter of measuring lights of decided color could be done by three operations, as follows: By using the bolometer to determine the radiation, a photographic plate for the actinic rays, and a flicker photometer for the effects of after-image. He recommended the use of an illuminometer, having a reading card with black letters, on white background, for low intensities, and white letters on a gray background for high intensities.

Dr. Bell stated that, with the last named instrument the trouble would be that the result would be one of adaptation rather than perception, which was agreed to by Dr. Ashe. Mr. Sweet described a tungsten lamp which was constructed to meet with the necessary requirements of a standard.

The next matter taken up was the conclusion of the discussion on the papers of Drs. Ives and Simonini, which had been interrupted the day before. In this debate Dr. Steinmetz gave it as his opinion that the spectrum of the single firefly would show an even narrower area than that produced from the large number used by Dr. Ives. He further discussed the earliest, as well as the largest, application of selective radiation, the Welsbach mantle showing that the greenish color was characteristic of this phenomena.

The paper by Mr. Norman Macbeth, on "Some Results Obtained Through Illuminometry," contained a number of tests of illumination by means of mantle gas burners. No conclusions were drawn by the author, and the subject was not discussed.

Mr. L. B. Marks then read his paper on "Factory Lighting," which showed, in great detail, the conditions existing under both artificial and natural light.

A short discussion followed, in which Messrs. Miller, Forest, Rowe and Macbeth participated.

"Operating Efficiencies of Some Commercial Installations of Lighting Systems," by Mr. A. L. Eustace, was then presented.

The object of the author in endeavoring to show that commercial conditions greatly changed the situation regarding the efficiency of prismatic glassware was successful.

Mr. Lansingh said that the figures which he had given out some time ago were based upon the data available at that time and that they would have to be revised. A short discussion followed. The speakers included Messrs. Macbeth and Jones.

The paper on "Tests of Moore Tube Lighting Installations, New York

Post Office," prepared by Mr. E. P. Hyde and Mr. J. E. Woodwell was omitted, as the authors were unable to be present.

The final paper on "Tests of a Moore Tube," jointly by Mr. C. H. Sharp and Mr. P. S. Millar, was read by the latter. The data covered a test made by the authors for the Association of Edison Illuminating Companies. The efficiency of the tube was given as 2.49 watts per M.S.C.P.

In the discussion Dr. Ives gave some figures of a recent test as to the color value in connection with the paper he presented at the last annual convention. Mr. Warner stated that he had made some tests for efficiency which were 50 per cent. better than those given in the paper.

The total registration was 244 members and 185 guests.

The Exhibit.

In connection with the convention a most interesting exhibit of lighting appliances was held in a building a few doors from the assembly hall, which was notable for the elaborate displays of the individual exhibits rather than as to the number of exhibitors.

The Leeds-Northrup Company, of Philadelphia, exhibited a number of photometric and electrical instruments.

The Electrical Testing Laboratories had a booth with the following photometer screens in use so that they could be compared: Lummer-Brodhun contrast, Lummer-Brodhun Comparison, Martens bi-Prism, Bensen and Flicker. Messrs. Foote-Pierson & Company showed the Sharp-Millar photometers and a number of electrical measuring instruments. The Welsbach Company had as fine a display of gas fixtures as one could wish to see, and the tasteful arrangement of the exhibit gave an air of comfort quite unusual to such displays.

The Holophane Company showed an ever-increasing line of glassware for both gas and electric lamps, and the inevitable comparison booth. Full lines of the Holophane-D'Olier reflectors were also shown.

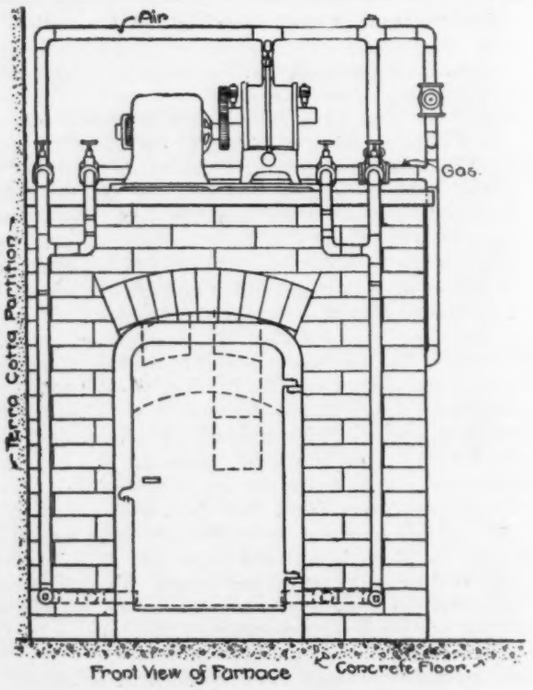
The General Electric Company had a generous display of arc and incandescent lamps; and the new Nernst lamps, with their attractive fixtures and various types of Cooper-Hewitt tubes, were exhibited.

The Westinghouse Company also showed a complete line of tungsten lamps with both opal and holophane reflectors.

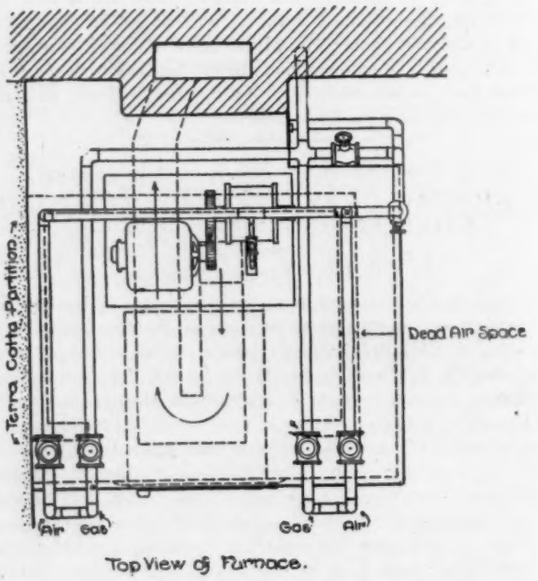
An educational feature of the exhibit consisted of three types of imported high pressure gas lamps: A Millennium, 2-burner upright, a Keith single-burner inverted, and a Graetzin 3-burner inverted.

Gas Heated Crematory used in the Johns Hopkins Hospital for the Disposal of Remains of Small Animals.

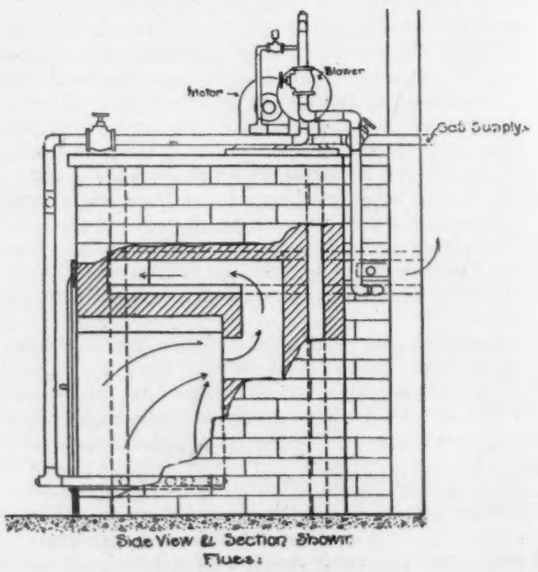
The latest "Monthly Bulletin" of the National Commercial Gas Association gives a well illustrated description of a crematory in use in the Johns Hopkins Hospital for the convenient and effective disposition of the remains of small animals that have been operated on in the line of research work. The furnace, which was especially designed and built for the hospital, is constructed entirely of firebrick. The oven, or crematory chamber, is 19 inches in length, 16 inches in width and 20 inches high. On each side of the oven, 3 bunsen burners, equally spaced, are arranged, which play on the content of the oven, the door of which is of cast iron, with baffle plate, covered with asbestos, on the inside. There is a 2-inch dead air space in the walls of the furnace. The products of combustion are carried by a flue 5 by 5½ inches, in a circuitous route to the chimney, the gas and air pipings are arranged as shown in the sketches herewith. Just prior to the junction of the gas and air pipes, the air is carried to pass through a small pipe concentric with the main pipe, the former being continued slightly beyond the junction pipe, air being thus used to induce and conduce the flow of gas. From this point to the burners the mixture passes through several feet of pipe, thus insuring a complete mingling. The burners proper are easily removable. A small electric blower, mounted on top of the furnace, is used to supply gas under pressure, and the air and gas supplies are controlled by independent valves. In addition to the main burners, an auxiliary burner is placed in the flue where it joins the chimney, the purpose of which is to ignite and burn any unconsumed gases that may travel thereto. The writer of this description, however, considers that such arrangement possesses no advantage and could well be eliminated. The furnace in actual trial work has proven satisfactory. Neither heat nor odor is emitted. The consumption of gas figures out at about 200 cubic feet per hour, and it has been satisfactorily proved that a small subject, weighing 20 pounds or so, can be reduced to ashes in a trifle over 1 hour.



Front View of Furnace



Top View of Furnace.



Side View & Section Shown

The Gas Company and Its Employees.

[Prepared for the JOURNAL by MR. E. H. YORKE.]

It will generally be admitted that whatever contributes to bring about a clearer understanding of the true relations between the gas company (the employer) and its working force (the employee) serves a useful purpose. With that end in view a brief consideration of the subject is presented. In the beginning it will be well to understand that each is dependent on the other.

For these reasons it is important that there shall be no misunderstanding as to the duty of each to the other, and also that each has inalienable rights. Let us, therefore, carefully examine what these rights and duties are.

At the outset of our inquiry we shall find: First, that the employee has labor to *sell*, and the employer labor to *buy*. This situation then reduces the matter to a commercial basis, and for this reason, like any other business transaction, it will be best to have a clear understanding, between both parties, of the exact terms of the agreement to be entered into.

The employee should understand and agree to the following:

That he is entering a hazardous business; that he must conform to the rules and regulations of his employer; that he must faithfully obey, to the best of his ability, all proper orders given him by his superiors; that he must be loyal to his employer's interests.

The employer will, on the other hand (and his best interests dictate that he shall), see that his employees' rights are properly observed and conserved.

That his employees receive fair treatment and a respectful hearing when they feel that they (the employees) have grievances to present.

To the end of establishing the exact status of the employee, in the matter of the time due and given his employer, and in order to regulate the acts and estimate the value of the individual employee, I have used for several years the appended forms with very satisfactory results:

EMPLOYEES LATE.

This form is filled in weekly from the time recorder slips, and the total charged up to the employee.

2-08-1000-S. P. Co.

EMPLOYEE LATE.

Week ending,.....190

Name .....

DAY OF WEEK.	TIME OF DAY. A.M.	M.	P. M.	EVENING.
Sunday,				
Monday,				
Tuesday,				
Wednesday,				
Thursday,				
Friday,				
Saturday,				

.....

ABSENTEES.

This form is filled out by the general foremen of the different departments and furnishes a valuable record.

8.09—T. P. Co.—1000

Dept.....
Occupation.....

ABSENTEE.....

Week Ending..... 19	Date	Total Time
Did Absentee give notice of intention to be absent	Time Out	
Reason given for being absent	Time Allowed by Time Keeper	days
Expects to return	Time approved by Engineer and Supt.	
REMARKS. ....Foreman	REMARKS. .... Engineer and Supt.	

OVERTIME CARD.

This card is filled out by the foreman.

DEP'T.....

NAME.....

OVERTIME CARD.

Date.....19....

Occupation.....
From ..... o'clock to.....o'clock.
Total hours.....
Work .....
Where.....
.....
Remarks .....
.....

CHECKED.

.....Foreman.
.....E. and S.

OVERTIME CERTIFICATE.

This certificate is issued for overtime.

No..... ORIGINAL.

OVERTIME CERTIFICATE.

... .19....

....Occupation,.....

THIS CERTIFICATE entitles you to an allowance of ..... day off, with pay, as an offset to an equal amount of overtime, this date. To secure this time allowance this certificate must be presented to your time keeper.

..... Engineer and Supt.

DEBITS.

When less time than the full amount of time allowed by this certificate is used, the number of hours off will by punched in the margin.

Hours	1	2	3	4	5	6	7	8	9

CAUTION NOTICE.

This notice is handed employees for acts or omissions of a minor character, and has proved more efficacious than a verbal caution which perhaps is ofttimes forgotten.

EMPLOYEES' CAUTION NOTICE.

The most important feeling to be created in the mind of the employee is that the "boss" is a just man, and he (the employee) is sure to get a "square deal."

OFFICE ORIGINAL. This Notice.....
ENGINEER AND SUPERINTENDENT. TOTAL TO DATE.....

A EMPLOYEE'S CAUTION NOTICE.

.....19

To.....Occupation.....

The following act-omission of yours is reported:

.....
.....
.....
.....

I desire to caution you against allowing the above to occur again.

.....
Engineer and Superintendent.

SHORTCOMING SERVICE.

Is given employee for dereliction of a serious nature, but not sufficiently serious for dismissal, at least the first few offences.

This Notice No..... ORIGINAL. Attention.....
Total to date..... **MEMORANDUM.**

B SHORTCOMING SERVICE.

Date this Notice.....190 S. S. occurred.....190

Cause List.		The Shortcoming Herein Specified Appears to be Due to that Cause Checked in the Cause List.
Carelessness	....	Shortcoming :— .....
Exaggerated Ego	....	.....
Forgetfulness	....	.....
Heedlessness	....	.....
Inertness	....	.....
Inattention	....	.....
Indifference	....	.....
Insubordination	....	.....
Laziness	....	.....
Poor judgment	....	.....
Talking too much	....	.....
Too many drinks	....	Result: .....
Unreliability	....	.....
.....	....	.....

NOTE.—The employee to whose attention the above is drawn must understand that the above shortcoming is unsatisfactory service, and it is hoped that he will hereafter endeavor to avoid a repetition.

COPY OF S. S. FILES.

EMPLOYEES' EFFICIENCY RECORD.

This form is to record instances of inefficiency of individual employee. Their value comes from their cumulative character and furnishes data for fairly determining the efficiency of employees from a clear and unprejudiced review of the employee's own acts. Their value also comes from the fact that they eliminate the memory factor.

EMPLOYEE'S EFFICIENCY RECORD.

Filled by.....Eng. and Supt.

EMPLOYEE.....*DATE*.....19

INSTANCE SHOWING.....

.....

.....

.....

.....

.....

.....

Employee's Excuse.....

.....

The foregoing forms contribute to that end, and help to bring about harmonious business relations between the gas company and its employees.

Meeting Times of the Various Gas Associations.

American Gas Institute.—Annual meeting, October 20, 1909. Detroit, Mich. Officers: President, Chas. F. Prichard, Lynn, Mass.: Secretary, A. B. Beadle, 29 West 39th street, N. Y. City.

Canadian Gas Association.—Annual meeting, June, 1909. Hamilton, Ont. Officers: President, J. S. Norris, Montreal, P. Q.; Secretary and Treasurer, A. W. Moore, Woodstock, Ont.

Empire State Gas and Electric Association.—Annual meeting, October 6 and 7, 1909, New York City. Officers: President, William T. Morris; Secretary, C. H. B. Chapin. 29 W. 39th street. New York City.

Guild of Gas Managers of New England.—Annual meeting, December. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, A. K. Quinn; Newport, R. I.; Secretary, Walter G. Africa, Manchester, N. H.

Illinois Gas Association.—Annual meeting, time, March 18, 1910, Chicago, Ills. Officers: President, E. G. Schmidt, Springfield, Ills.; Secretary-Treasurer, C. B. Strohn, Elgin, Ills.

Illuminating Engineering Society.—Annual meeting, January 14, 1910. Meetings of Sections, monthly. Secretary, Preston S. Millar, 29 W. 39th street, N. Y. City Sections: New York: Secretary, Albert J. Marshall, 437 5th aveuue. New England, Secretary, L. D. Gibbs, 39 Boylston street, Boston, Mass. Philadelphia, Secretary, J. D. Israel, 1000 Chestnut street. Chicago, Secretary, G. H Jones, 139 Adams street. Pittsburgh, Secretary, J. C. McQuiston, 10 Mifflin avenue, Edgewood Park, Pa.

Indiana Gas Association.—Annual meeting, January 19, 1910, Indianapolis, Ind. Officers: President, J. W. Dunbar, New Albany, Ind.; Secretary-Treasurer, Philmer Eves, Indianapolis Gas Company, Indianapolis, Ind.

Iowa District Gas Association.—Annual meeting, time, June 23, 24, 25, 1910, Sioux City, Ia. Officers: President, Geo. H. Waring, Omaha, Neb.: Secretary and Treasurer, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, time, ———— Wichita, Kas. Officers: President, W. A. Scothorn, Hutchinson, Kas.; Secretary and Treasurer, J. D. Nicholson, Newton, Kas.

Michigan Gas Association.—Annual meeting, time, ————, 1910; ———— Officers: President, B. O. Tippy, Grand Rapids, Mich.; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April 14, 15 and 16, 1910; JeffersonCity, Mo. Officers: President, W. A. Bixby; Secretary and Treasurer, C. L. Clary, Sikeston, Mo.

National Commercial Gas Association.—Annual meeting, Dec. 14, 1909; Philadelphia, Pa. Officers: President, J. D. Shattuck, Chester, Pa.; Secretary-Treasurer, Lucius S. Bigelow, 265 Broadway, New York City.

Natural Gas Association.—Annual meeting, May 17, 18 and 19, 1910; Oklahoma City, Okla. Officers: President, William H. McKenzie, Kansas City, Kas.; Secretary, T. C. Jones, Delaware, O.

New England Gas Association.—Annual meeting, third Wednesday in February; Boston. Officers: President, Walter G. Africa, Manchester, N. H.: Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

Oklahoma Electric Light, Railway and Gas Association.—Annual meeting, May 18, 19 and 20, 1910; Oklahoma City. Officers: President, F. H. Tidman, Oklahoma City, Okla.; Secretary-Treasurer, Galen Crow, Guthrie, Okla.

Pacific Coast Gas Association.—Annual meeting, ————, 1910, Los Angeles, Cal. Officers: President, W. R. Cline, Los Angeles, Cal.; Secretary-Treasurer, John A. Britton, 925 Franklin street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, April 13, 1910, Easton, Pa. Officers: President, E. G. Holzer, Easton, Pa.: Secretary-Treasurer, William H. Merritt, Lebanon, Pa.

Society of Gas Lighting.—Annual meeting, Dec. 9, 1909; monthly meeting, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary George G. Ramsdell. 1123 Broadway, New York.

Southern Gas Association.—Annual meeting, Feb. 16, 1910, Chattanooga, Tenn. Officers: President, R. C. Congdon, Atlanta, Ala.; Secretary-Treasurer, James Ferrier, Rome, Ga.

Southwestern Electrical and Gas Association.—Annual meeting. ———— Dallas, Tex. Officers: President, R. B. Stichter, Dallas, Tex.; Secretary's office, 300 Commerce street, Dallas, Tex.

Wisconsin Gas Association.—Annual meeting, May 11 and 12, 1910, Milwaukee, Wis. Officers: President, R B. Brown, Milwaukee, Wis.; Secretary-Treasurer, H. H. Hyde, Racine, Wis.

Items of Interest
FROM VARIOUS LOCALITIES.

MR. E. C. WHITE informs us that recent orders for apparatus have been received by the Western Gas Construction Company for the following: Spokane Falls (Wash.) Gas Light Company, a 9-foot water gas set, complete—their order also calls for a relief holder up to retaining 50,000 cubic feet. For the Tacoma (Wash.) Gas Light Company, one 8-foot 6-inch water gas set, complete. For the Ann Arbor (Mich.) Gas Light Company, a storage holder with a rated capacity of 500,000 cubic feet—this holder is to rest in steel tank.

"T. S. B.," writing from Schenectady, N. Y., under date of the 29th ult., says: "I didn't believe the electric end to these contests would say much about them, but so that positively you may know what happened to the athletes (?) of the Schenectady Illuminating Company, Saturday last, I hereby furnish the raw details. The occasion was the second coming together of the employees of the Mohawk Gas Company and the Schenectady Illuminating Company—the latter are tungstenites. The field was Endries Park; the occasion, second annual clambake of the united forces. The programme was thus made up: 100-yard dash (20 entries), 3-legged race (6 entries), shot putting (14 entries), broad jump (13 entries), high jump (9 entries), quarter mile relay race, and a baseball game—the latter being the last of a series of three. Well, the result was that the gas men won the card. The baseball game was a beauty, with a score of 1 to 0."

MESSRS. BARTLETT-HAYWARD CO., are to build the new meter house for the Providence (R. I.) Gas Company. It is to be of brick and iron, and one story high, and 56 feet 8 inches by 52 feet 8 inches.

MESSRS. R. P. DUNKLIN, B. S. Allday and B. H. Singletary are said to be interested in a project to establish a gas works in Atlanta, Cass county, Tex.

MESSRS. H. M. BYLLESBY & COMPANY'S ownership of the San Diego (Cal.) Consolidated Gas and Electric Company, seems to be going on smoothly, the Board of Directors having declared a quarterly dividend of 1¼ per cent. on the preferred stock. It is payable the 15th inst.

THE proprietors of the Macomb (Ills.) Electric Light and Gas Company have added 2 steam boilers to the generating plant, which outfit will enable them to keep up with certainty an all-night service the coming winter.

AT the annual meeting of the Granville (N. Y.) Electric and Gas Company, the officers elected were: President, B. G. Higley; Vice-Presidents, Geo. Tait and F. T. Pember; Secretary, H. G. Stevens; General Manager, F. S. Fogg.

MR. D. T. BURRITT has resigned the position of Superintendent of the Springfield (Mass.) Gas Light Company. We are informed that Mr. Burritt will likely take charge of a gas plant in Canada, the exact name of which our informant did not care to say. On the day of his retiring from the management of the Springfield works the works' men presented him with a gold watch chain, to which was attached a handsome charm of the Knight Templar order.

THE City Council of Oklahoma City (Okla.) has ordered that a special election shall be held the 28th inst., to pass upon the new form of ordinance demanded by Messrs. W. Harris & Co., of Chicago, the proprietors of the plan to continue the operation of the Oklahoma Gas and Electric Company.

MR. FREDERICK A. COOK has been appointed Superintendent of the gas and electric plants owned and operated by the Essex (Mass.) Light and Power Company. His predecessor (Mr. George B. Stillman) has accepted a responsible place on the force of Messrs. Comstock, Cheney & Co., at Ivoryton, Mass.

LOCAL gossip has it that the plant of the Poughkeepsie (N. Y.) Light, Heat and Power Company will be rebuilt, at an estimated cost of $375,000.

MR. WILLIAM PAGE, who has been in the service of the Cambridge (Md.) Gas Company for some years, has accepted a responsible posi-

tion in the service of the Hyattsville (Md.) Gas and Electric Light Company.

THE plant of the Sherman (Tex.) Gas Light and Fuel Company is to be rebuilt, under the immediate direction of Mr. William M. Chaffin, Jr.

THE jury in the case of Harris, *et al.* against the Jackson (Miss.) Gas Light Company, in a suit for damages arising over the death of Simeon Harris, who was, through accidental contact with defective wires of the Company, shocked to death last March, the jury returned a verdict for plaintiffs in the sum of $15,625. The sum sued for was $25,000. The award was based on the contributory negligence plea.

"B. R. T.," writing under date of the 4th inst., incloses this advertisement which was inserted at the instance of the local gas company in the columns of the leading newspaper of the district:

A disappointing announcement to
Peary-odical callers at the North Pole.

"Cook just left.
"Cause, doggone ice giving out.
"For further information inquire of
"S. Q. MAUS."

"If you Cook with gas
"the
"Cook will stay."

MR. O. B. KOHL, Manager of the plant and business of the Antigo (Wis.) Gas Company, declares that gas will be turned into the street mains by the 20th inst. Six miles of mains have been placed. In connection with the supply Manager Kohl made the following announcement the first week in this month: "For the remainder of this year, or until the frost line prevents further digging out the earth, all persons living along the present line of mains who desire to use gas in their homes, either for lighting or fuel purposes, or both, will receive free connections to the meter and gas cooking appliances, together with lighting fixtures as well, who will inform the Company as to what they propose to do. And further provided that such cooking apparatus, etc., has been purchased from the Company. The rates to rule are as follows: Minimum charge, 60 cents per month, with a 10 per cent. discount if paid on or before the 10th of the following month, entitling the consumer to use 375 cubic feet of gas. For the first 10,000 cubic feet per month, $1.60 per 1,000, less 10 per cent. for prompt payment—within 10 days. All over 10,000 cubic feet, $1.60 per 1,000 cubic feet, less 20 cents per 1,000 for prompt payment. These figures apply to gas used for fuel or illuminating purposes only, but all those who use gas for both illumination and fuel purposes an extra discount of 10 cents per 1,000 becomes operative. All appliances are to be sold at cost, and a reduction in rates will be made as soon as the residents show, by increased patronage, that the efforts of the Company's proprietors in putting the trading on a paying basis have been given the attention that their enterprise has merited."

LAST month the report for the twelvemonth to the Public Service Commission, of New York, by the Brooklyn (N. Y.) Union Gas Company showed the following healthy state of affairs: Sales of gas on all account brought in the sum of $7,931,256.23, an increase of $570,187.30 from the amount obtained last year. In addition to the revenue from the gas service there were profits from the sale of stoves and appliances, the renting of lamps and returns from sendout amounting to $18,972.65, but there was a considerable falling off in that class of business, the profits in that line in 1907 having been much greater. Against the total revenues of $7,949,728.88 for the year there were the expenses of production and operation. The cost of production, according to the sta'ement, was $3,603,403.80; distribution cost, $534,044.61, and leakage, depreciation, general expenses, etc., absorbed $1,663,594.39. Taxes amounted to $445,568.08, and bad debts were responsible for a shrinkage of $51,830.82, so that revenue was thereby decreased in the sum of $6,298,468.68. Profits of operation returned a clear income of $1,746,447.12, out of which the Company paid sums on account of interest, rentals, etc., totalling, $995,325.10. The net corporate income for the twelvemonth was thus shown to be $751,122.02, which sent the surplus account (end of 1908) to $4,406,978.02. Some of the surplus was paid out in dividends, 2½ per cent. extra having been divided on $15,000,000 of stock, and 3 per cent. on $15,484,000. "Other debentures," as the report notes, an some additions in the instances of old accounts collected, left the net surplus at the current figures of $3,520,104.95. The subsidiary Companies owned by the Brooklyn Union—the Flatbush, Jamaica, Newtown, Richmond Hill and Queens County and the Woodhaven—showed substantial gains.

THE shareholders of the Public Service Corporation, at a meeting held some days ago in Newark, N. J., approved the proposition to remit their properties to the Public Service Gas Company. The shareholders also authorized an issue of $50,000,000 to secure bonds of like amount, which will be put out from time to time for improvements that may become necessary. This is really but a readjustment of the plan of operating the properties—gas, electric light and street railway—so that the earnings of each may be properly or minutely traced at any time.

MR. R. C. GRAVELY, formerly Assistant Superintendent of the North Penn (Pa.) Gas Light Company, has been appointed Manager of the new business division of the Hanover (Pa.) Gas Company.

"MR. ALBERT DUNBAR, of the Consolidated Gas Company, Boston, Mass., was united in marriage to Miss Villa M. Phelan, of Ash Point, Mass., noon of Wednesday, September 15th. The marriage ceremony was performed by the Reverend D. B. Phelan, Superintendent of the Rockland M. E. district, the father of the bride, at the Methodist church, Rockland. He was assisted by Rev. B. P. Judd, pastor of the church.—R."

"THE last Saturday in September was the beginning of a new era in the history of Charles City, Ia.," so writes "W. G. T.," for on that day for the first time her citizens were supplied with artificial gas, in ample volume for any purpose. This important event occurred through turning into 10 miles of street mains the gas, which, from this time on, will be the source of uninterrupted comfort and convenience to those who are patrons of the Charles City Gas Company. The record made by the Company in builbing this plant is unusual, as it was just 90 days from the time the work was started until the gas was turned on, and during this time one of the most complete plants of its kind has been built, including the putting in of 10 miles of street mains and 150 house connections. Messrs. Mark & Wright were the coutractors on the buildings and foundations. The Gas Machinery Company, of Cleveland, O., installed the gas making apparatus and machinery, and the Stacy Manufacturing Company, of Cincinnati, O., built the two gasholders, while S. L. Kern had the contract for excavating and refilling the necessary ditches for the gas mains, and the Company's pipe crews laid all the pipe for mains and made the house connections, which were tested with air pressure. The Company also maintains an office at 709 Kelly street, as modern and well equipped as is its plant and where the manage ment can look after the needs of their customers. They are at all times glad to receive those interested in investigating this new enterprise. Mr. Z. T. F. Runner, of Freeport, Ills., President of the Company, has been spending some time in Charles City looking after the testing of the plant equipment and returned here highly gratified with the results of his investigation, and states that everything is up to the high standard necessary for the first-class service which he expects the Company to render the public.

THE people of Babylon, Long Island, are anxious to have a gas supply, but the authorities will neither move on their own account, nor on that of those who have asked them for the necessary consent. The latest applier for a franchise is Mr. H. A. Odell, who is not unfamiliar to the men in this section. At any rate, Odell has asked for franchise rights; but these he will have a hard time obtaining, when it is remembered that one of the principal owners of the local lighting concern is a very high office holder.

GAS was supplied in Grinnell, Ia., for the first time on the 24th ult. This plant, which was constructed in less than 100 days—it has 12 miles of mains in its distribution as a starter—is controlled, if not altogether owned, by Mr. Oscar B. Mathews. We hope his business perspicacity in this instance will bring him returns.

THE East Greenwich Gas Company, the proprietors of which propose to supply gas to the settlements of Clarksboro, Mickleton, Mullion Hill and Mount Royal Hill, Pa., has been incorporated by Messrs. Jas. T. Hudd, C. C. Hughes, A. F. Hoffman and I. T. Hains. It is capitalized in $35,000. It is not proposed to build a separate works, but to take a high pressure supply from the plant of the Putman-Glassboro-Clayton Company.

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

THOS. J. CUNNINGHAM,
ELBERT P. CALLENDER,
EDITORS.

MONDAY, OCTOBER 11, 1909.

The Market for Gas Securities.

The uncertain condition of the general share market is pretty well reflected in quotations for city gas shares, which are lower than those recorded for some time. Consolidated opened to-day (Friday) at 144¾ to 145, and while quite some stock was offered, not all of it was taken at these bids. Brooklyn Union was similarly regarded, the noon figures for which were 144 to 146. The hardening of interest rates is put out as the main reason for the decline; but why this should have any appreciable effect it is hard to realize. It is a certainty that rates must harden at least two months during each six months of the year, and these interest charges are certainties. Perhaps three-fourths of the interest and dividend disbursements of every sort and kind come due in May–June to November—December, and it is a week or fortnight before such dates that the cash is being held together ready for this interest contingency. Perhaps in time the real owners of shares of every kind and sort can induce dividend disbursements every 2 months instead of twice a year.

On its merits the market for gas shares should be of the very strongest sort.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

OCTOBER 11.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated Gas Co.	$73,177,000	100	144¾	145
Central Union Gas Co.—				
1st 5's, due 1972, J. & J.	3,000,000	1,000	98	101
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	—	105
Mutual Gas Co.	3,500,000	100	155	165
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	100	101½
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	37	43
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	—	100	101
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	104	107
Con. 5's, due 1945, J. & J.	1,500,000	—	97	101
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	94	100
Standard	5,000,000	100	—	75
Preferred	5,000,000	100	70	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	100	105
The Brooklyn Union	15,000,000	1,000	144	146
1st Con. 5's, due 1948, M. & N.	15,000,000	—	91½	92
Yonkers	299,650	500	130	—
Out-of-Town Companies.				
Bay State	50,000,000	50	1	1½
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	65
" 1st Mtg. 5's	500,000	1,000	90	96
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	73	73¼
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed Gold Bonds	7,000,000	1,000	104	106¼
Cincinnati Gas and Electric Co.	20,500,000	100	92	93
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt & Heating Co.	1,662,750	100	90½	91
Preferred	3,026,500	100	75¼	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	—	105
Mortgages, 6's	3,600,000	—	—	118
Chesapeake, 1st 6's	1,000,000	—	—	—
Equitable, 1st 6's	910,000	—	—	—
Consolidated, 1st 5's	1,490,000	—	—	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
Con. Mtg. 5's	880,000	1,000	92	95
Bonds	75,000	—	—	100
Denver Gas and Electric	458,000	—	102	105
Detroit City Gas Co	5,000,000	50	—	50
" Prior Lien 5's	4,619,000	1,000	97	100½
Detroit Gas Co., 5's	381,000	1,000	75	80
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	39	40
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co., 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	—	112	113½
" Bonds, 5's	10,500,000	—	103	103½
Indianapolis	2,000,000	—	60	70
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co., of Missouri	5,000,000	100	—	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede Gas Co., St. Louis.	10,000,000	100	104	105
Preferred	2,500,000	100	—	98
Bonds	10,000,000	1,000	104	—
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas and Electric Co.				
" 1st Mtg. 6's	350,000	1,000	106	106¾
" 6 per cent. scrip, due 1910	100,000	25	60	60½
Massachusetts Gas Companies, of Boston	25,000,000	100	69¾	69¾
Preferred	25,000,000	100	90½	94
Montreal Gas Co., Canada	2,000,000	100	218	218¾
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	56	58
Bonds, 6's	6,000,000	—	137	138
New Haven Gas Co.	2,000,000	25	200	—
Peoples Gas Lt. & Coke Co., Chicago	25,000,000	100	115¼	115⅝
1st Mortgage	20,100,000	1,000	—	—
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104½	105½
San Francisco Gas Co., Cal.	15,500,000	—	—	—
St. Joseph Gas Co.—				
1st Mtg. 5's	751,000	1,000	100	102
St. Paul Gas Light Co.	1,500,000	100	45	47
1st Mortgages, 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	2,465,000	1,000	90	95
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	100	101
Washington (D. C.) Gas Co.	4,600,000	20	333	334
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	230	—

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Helme & McIlhenny, Philadelphia, Pa.	903
John J. Griffin & Co., Philadelphia, Pa.	856
Keystone Meter Co., Royersford, Pa.	902
Maryland Meter and Mfg. Co., Baltimore, Md.	902
Metric Metal Co., Erie, Pa.	902
Nathaniel Tufts Meter Co., Boston, Mass.	902
New York Improved Meter Co., New York City.	902
Pittsburg Meter Co., East Pittsburg, Pa.	882
Rotary Meter Co., New York City	875
Sprague Meter Co., Bridgeport, Conn.	901

PREPAYMENT METERS.

American Meter Co., New York and Philadelphia.	903
D. McDonald & Co., Albany, N. Y.	901
Helme & McIlhenny, Philadelphia, Pa.	903
John J. Griffin & Co., Philadelphia, Pa.	856
Keystone Meter Co., Royersford, Pa.	902
Nathaniel Tufts Meter Co., Boston, Mass.	902
New York Improved Meter Co. New York City.	902
Pittsburg Meter Co., East Pittsburg, Pa.	882
Sprague Meter Co., Bridgeport, Conn.	901

PREPAYMENT METER ATTACHMENTS.

New York Improved Meter Co., New York City.	902

WATER METERS.

Pittsburg Meter Co., East Pittsburg, Pa.	882

GAS AND WATER PIPES.

Davis & Farnum Mfg. Co., Waltham, Mass..... 896
Donaldson Iron Co., Emaus, Pa..... 888
Economical Gas Apparatus Construc. Co., Toronto, Ont. 874
R. D. Wood & Co., Philadelphia, Pa..... 896

GAS COALS.

Berwind-White Coal Mining Co., New York and Phila. 884
Perkins Co., New York City..... 894
Westmoreland Gas Coal Co., Philadelphia, Pa..... 895

GAS MAIN STOPPERS.

Safety Gas Main Stopper Co., New York City..... 896

MAIN AND SERVICE LAYING.

Sullivan Bros., Flushing, N. Y..... 895

GAS TAPPING MACHINES.

George Light, Dayton, O..... 895
H. Mueller Manufacturing Co., Decatur, Ills..... 879

CANNEL COALS.

Perkins & Co., New York City..... 894

STOKING MACHINERY.

Chamber Oven Co., Milwaukee, Wis..... 879
G. A. Bronder, New York City..... 893
Laclede-Christy Clay Products Co., St. Louis, Mo..... 892
Parker-Russell Mining and Mfg. Co., St. Louis, Mo..... 886

CONVEYORS—ALL KINDS.

Bartlett-Hayward Co., Baltimore, Md..... 897
Chamber Oven Co., Milwaukee, Wis..... 879
Cruse-Kemper Co., Philadelphia, Pa..... 884
C. W. Hunt Company, New York City..... 896
Economical Gas Apparatus Construc. Co., Toronto, Ont. 874
G. A. Bronder, New York City..... 893
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 897
The Gas Machinery Co., Cleveland, O..... 876
The Stacey Mfg. Co., Cincinnati, O..... 899
Western Gas Construction Co., Fort Wayne, Ind..... 904

CHARGING BARROWS & COAL WAGONS.

Davis & Farnum Mfg. Co., Waltham, Mass..... 896
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 897
The Stacey Mfg. Co., Cincinnati, O..... 899

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Standard Oil Co., New York City..... 895

COKE CRUSHERS.

Bartlett-Hayward Co., Baltimore, Md..... 897
C. M. Keller, Columbus, Ind..... 895

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H. Mueller Manufacturing Co., Decatur, Ills..... 879

GAS COCKS.

H. Mueller Manufacturing Co., Decatur, Ills..... 879

GAS GAUGES.

The Bristol Co., Waterbury, Conn..... 888

GAS GOVERNORS.

Chaplin-Fulton Mfg. Co., Pittsburg, Pa..... 894
Connelly Iron Sponge & Governor Co., New York City. 893
Evens & Howard Firebrick Co., St. Louis, Mo..... 886
Isbell-Porter Co., Newark, N. J..... 884
Pittsburg Meter Co., East Pittsburg, Pa..... 882
Reynolds Gas Regulator Co., Anderson, Ind..... 893

CEMENTS.

C. L. Gerould, New Castle, Pa..... 892
Laclede-Christy Clay Products Co., St. Louis, Mo..... 892
Strassburger Bros., Chicago, Ills..... 893

RETORTS AND FIREBRICKS.

Baltimore Retort and Firebrick Co., Baltimore, Md... 892
Chamber Oven Co., Milwaukee, Wis..... 879
Didier-March Co., New York City..... 877
Evens & Howard Firebrick Co., St. Louis, Mo..... 886
Gas Bench Construction Co., St. Louis, Mo..... 885
Henry Maurer & Son, New York City..... 895
Improved Equipment Company, New York City..... 878
James Gardner, Jr., Co., Bolivar, Pa..... 894
J. H. Gautier & Co., Jersey City, N. J..... 892
Laclede-Christy Clay Products Co., St. Louis, Mo..... 892
Missouri Firebrick Co., St. Louis, Mo..... 892
Parker-Russell Mining and Mfg. Co., St. Louis, Mo.... 886

INCLINED RETORTS.

Baltimore Retort and Firebrick Co., Baltimore, Md... 892
Chamber Oven Co., Milwaukee, Wis..... 879
Didier-March Co., New York City..... 877
Evens & Howard Firebrick Co., St. Louis, Mo..... 886
Gas Bench Construction Co., St. Louis, Mo..... 885
Improved Equipment Company, New York City..... 878
Laclede-Christy Clay Products Co., St. Louis, Mo..... 892
Parker-Russell Mining and Mfg. Co., St. Louis, Mo... 886

VERTICAL S'S.

Chamber Oven Co., Milwaukee, Wis..... 879
Connelly Iron Sponge & Gov. Co. (Drake's [Eng.] System) 893
Didier-March Co., New York City..... 877
Evens & Howard Firebrick Co., St. Louis, Mo..... 886
Gas Bench Construction Co., St. Louis, Mo..... 885
Improved Equipment Company, New York City..... 878
Laclede-Christy Clay Products Co., St. Louis, Mo..... 892
Parker-Russell Mining and Mfg. Co., St. Louis, Mo. .. 886

REGENERATIVE FURNACES.

Baltimore Retort and Firebrick Co., Baltimore, Md.. 892
Chamber Oven Co., Milwaukee, Wis..... 879
Bartlett, Hayward & Co., Baltimore, Md..... 897
Didier-March Co., New York City..... 877
Evens & Howard Firebrick Co., St. Louis, Mo..... 886
Gas Bench Construction Co., St. Louis, Mo..... 885
Improved Equipment Company, New York City..... 878
J. H. Gautier & Co., Jersey City, N. J..... 892
Laclede-Christy Clay Products Co., St. Louis, Mo..... 892
Missouri Firebrick Co., St. Louis, Mo..... 892
Parker-Russell Mining and Mfg. Co., St. Louis, Mo... 886

SELF-SEALING MOUTHPIECE DOORS.

Bartlett-Hayward Co., Baltimore, Md..... 897
Chamber Oven Co., Milwaukee, Wis..... 879
Continental Iron Works, Brooklyn, N. Y..... 893
Davis & Farnum Mfg. Co., Waltham, Mass..... 896
Isbell-Porter Co., Newark, N. J..... 884
Improved Equipment Company, New York City..... 878
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 897
Parker-Russell Mining and Mfg. Co., St. Louis, Mo..... 886
Quintard Iron Works, New York City..... 895
R. D. Wood & Co., Philadelphia, Pa..... 893
The Gas Machinery Co., Cleveland, O..... 876
The Stacey Mfg. Co., Cincinnati, O..... 899
Western Gas Construction Co., Fort Wayne, Ind..... 904

INCANDESCENT GAS LAMPS.

General Gas Light Co., Kalamazoo, Mich..... 881
Welsbach Company, Gloucester, N. J..... 890

BURNERS.

Wm. M. Crane Co., New York City..... 888

STREET LAMPS.

Thos. T. W. Miner, New York City..... 874
Welsbach Street Lighting Co., New York and Phila.. 890

GAS BLAST FURNACES.

American Gas Furnace Co., New York City..... 880

PURIFIERS.

Bartlett-Hayward & Co., Baltimore, Md..... 897
Connelly Iron Sponge & Governor Co., New York City. 893
Cruse-Kemper Co., Philadelphia, Pa..... 884
Davis & Farnum Mfg. Co., Waltham, Mass..... 896
Evens & Howard Firebrick Co., St. Louis, Mo..... 886
Isbell-Porter Co., Newark, N. J..... 884
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 897
Quintard Iron Works, New York City..... 895
R. D. Wood & Co., Philadelphia, Pa..... 893
The Stacey Mfg. Co., Cincinnati, O..... 899
The United Gas Improvement Co., Philadelphia, Pa... 891
Western Gas Construction Co., Fort Wayne, Ind..... 904

VALVES.

Bartlett-Hayward & Co., Baltimore, Md..... 897
Continental Iron Works, Brookln, N. Y..... 894
Davis & Farnum Mfg. Co., Waltham, Mass..... 896
Economical Gas Apparatus Construc. Co., Toronto, Ont. 874
Isbell-Porter Co., Newark, N. J..... 884
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 897
Ludlow Valve Manufacturing Co., Troy, N. Y..... 895
R. D. Wood & Co., Philadelphia, Pa..... 893
The Gas Machinery Co., Cleveland, O..... 876
The P. H. & F. M. Roots Co., Connersville, Ind..... 887
The Stacey Mfg. Co., Cincinnati, O..... 899
Western Gas Construction Co., Fort Wayne, Ind..... 904

(*Continued on page 874.*)

DIVIDEND NOTICE.

OFFICE OF THE UNITED GAS IMPROVEMENT CO.,
N. W. CORNER BROAD AND ARCH STS.,
PHILADELPHIA, PA., Sept. 8, 1909.

The Directors have this day declared a quarterly dividend of 2 per cent. (one dollar per share), payable Oct. 15th, 1909, to stockholders of record at the close of business, Sept. 30, 1909. Checks will be mailed.

1788-5 LEWIS LILLIE, Treasurer.

WANTED,

A Position as Manager or Superintendet

Of a coal or water gas plant, or combined plant. Am getting the best of results at present place of employment. Have excellent recommendations. Address, "F. J. R."

1791-2 Care this Journal.

Position Wanted

As Manager or Superintendent,

By a man having 12 years' experience in the manufacture and distribution of both coal and water gas. Best of references. Address, "H. G.,"

1791-2 Care this Journal.

WANTED,

Engineer to Superintend Construction of Large By-Product Coke Oven Plant, Including Recovery Apparatus.

Must be thoroughly first-class man with experience, covering oven design and erection. Immediate connection. Address, "FUEL,"

1792-2 Care this Journal.

WANTED AT ONCE,

A Young Man with Some Experience in the Reading of Gas and Electric Meters.

Must be attentive to duties and energetic. None other need apply. Good salary to right party. Address,

GRAND FORKS GAS & ELECTRIC CO.,
1792-1 GRAND FORKS, N. D.

WANTED,

GASFITTER for MIDDLE WEST,

Town of 10,000. Good estimator house piping, new and old installation.

1791-2 Address, "VENDOR," care this Journal.

GAS SOLICITOR WANTED.

Experienced gas appliance solicitor, who can show results. State experience and give reference. Address, "J. C. L.,"

1791-3 Care this Journal.

WANTED,

Either an experienced salesman or a man of good address who is familiar with the design, construction and operation of coal gas benches, to travel for first-class bench builders. State age, experience and salary expected. Address, "X. Y. Z.,"

1791-tf Care this Journal.

WANTED,

A Man who is Capable of Taking Full Charge of a Gas and Electric Plant

In a small town in New York State, making water gas. Must understand the manufacture and distribution of gas and electricity thoroughly. State qualifications and salary expected. Address, "W. C.," care this Journal.

1791-4

WANTED,

The names or catalogues of firms making plants for the manufacture of sulphate of ammonia from gas works' liquor. Address, "A. L. C."

1792-1 Care this Journal.

WANTED,

To Buy a 5-Foot, Second-hand, Water Gas Set,

Complete, with seal, scrubber and condenser. Give price. Address, "F. S.,"

1794-1 Care this Journal.

FOR SALE,

Two 6-Foot Double Superheater Water Gas Sets, one of the U. G. I. and the other Gas Machinery manufacture, complete, with seals, condenser, scrubber, etc. Also, **4 Kerr Murray 13 x 14 x 3 Purifiers,** and **No. 6 DeLaval Turbine-Driven Sturtevant Blower.** These may be seen in operation. Are sold only to make room for a larger set.

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Three volumes. Edition 1882. Price, $100.

Address,
AMERICAN GAS LIGHT JOURNAL,
42 PINE STREET, NEW YORK CITY.

FOR SALE,

One set of 4 purifying boxes 12 feet 8 inches by 10 feet 9 inches by 3 feet, in good condition, with centerseal and 10-inch connections. Also one American 8-foot station meter.

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118 Improved Lamp Frames, Burners, Globes, Domes, Tops,

Used three years in city of Richmond, Ky., for gas street lighting. Model 18, made by the Cleveland Street Lighting Company, of Cleveland, O.

Address, B. R. DOHERTY,
1791-4 Supt. Richmond Water and Light Co.

(Concluded from page 873.)

PURIFYING MATERIALS.

Connelly Iron Sponge & Governor Co., New York City 893
F. Behrend, New York City 874
The United Gas Improvement Co., Philadelphia, Pa... 891

EXHAUSTERS.

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Humphrey Co., Kalamazoo, Mich..... 874

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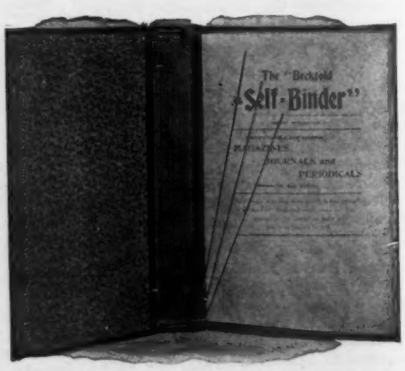

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Mr. L. Kemper, Manager of the Albert Lea (Minn.) Light and Power Co., who was in attendance and took part in the discussion, hit the nail squarely on the head when he said what he repeats in the subjoined letter.

We delivered to the Albert Lea Company in February, 1909, a Rotary Meter of 7,500 cu. ft. maximum capacity per hour.

CAPITAL, $400,000

Albert Lea Light and Power Co.

(INCORPORATED)

LUDWIG KEMPER, Treas. and Mgr.

AND INCANDESCENT LIGHTING
DAY CIRCUIT FOR POWER

OFFICE 136 W. CLARK ST.
BOTH PHONES

HOT WATER HEATING
GAS FOR ALL PURPOSES

ALBERT LEA, MINN., Aug. 20, 1909.

Rotary Meter Company,
280 Broadway,
New York, N. Y.

Gentlemen:-

Your favor of the 18th inst. is at hand, and in reply beg to say that in speaking before the Iowa Convention we had in mind the Rotary Meter that we bought from you in January. You are at liberty to use our remarks in any way that you may see fit.

We have, however, corrected these remarks, as the reporter at the convention did not get them down correctly, as follows:

Now, the question of station meters; we did not have a station meter until about six months ago. I might say that it was a revelation when the station meter went in. Before we were measuring in and out of the holder with the scale on the holder. Some months we would sell a lot more gas than we had made, but now with a meter we are doing that no more.

Yours truly,
Albert Lea Light & Power Co.
L. Kemper
Treas. & Mgr.

One-half the Cost—One-tenth the Space of Old Style Wet Meters.

When in Need of Station Meters Write

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Our Literature will be sent on request.

(Concluded from page 873.)

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821 and 823 Eagle Avenue, New York.

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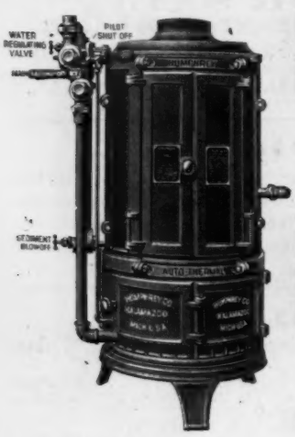

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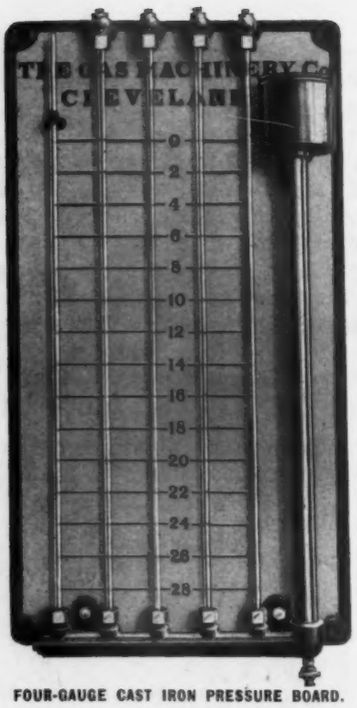

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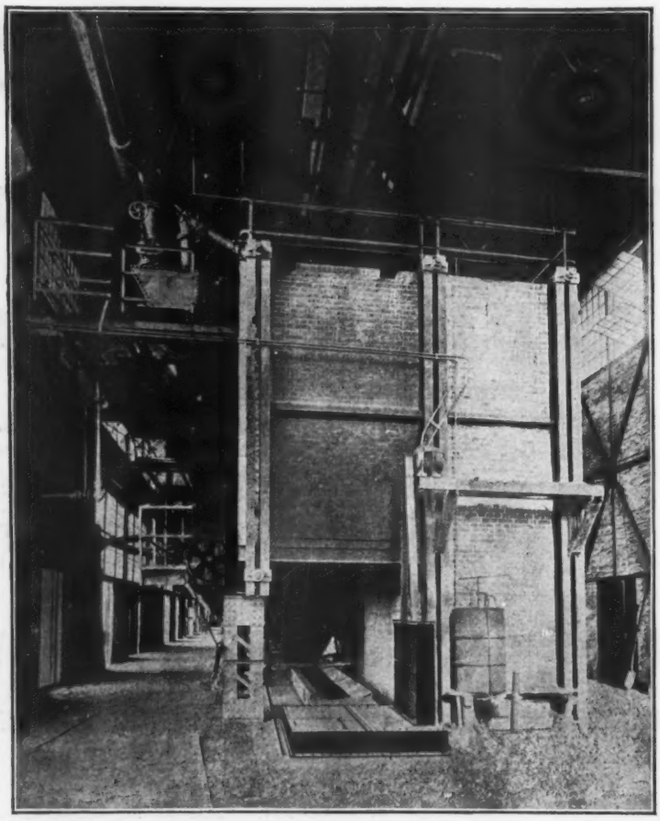

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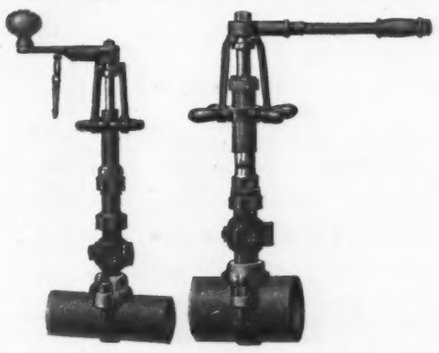

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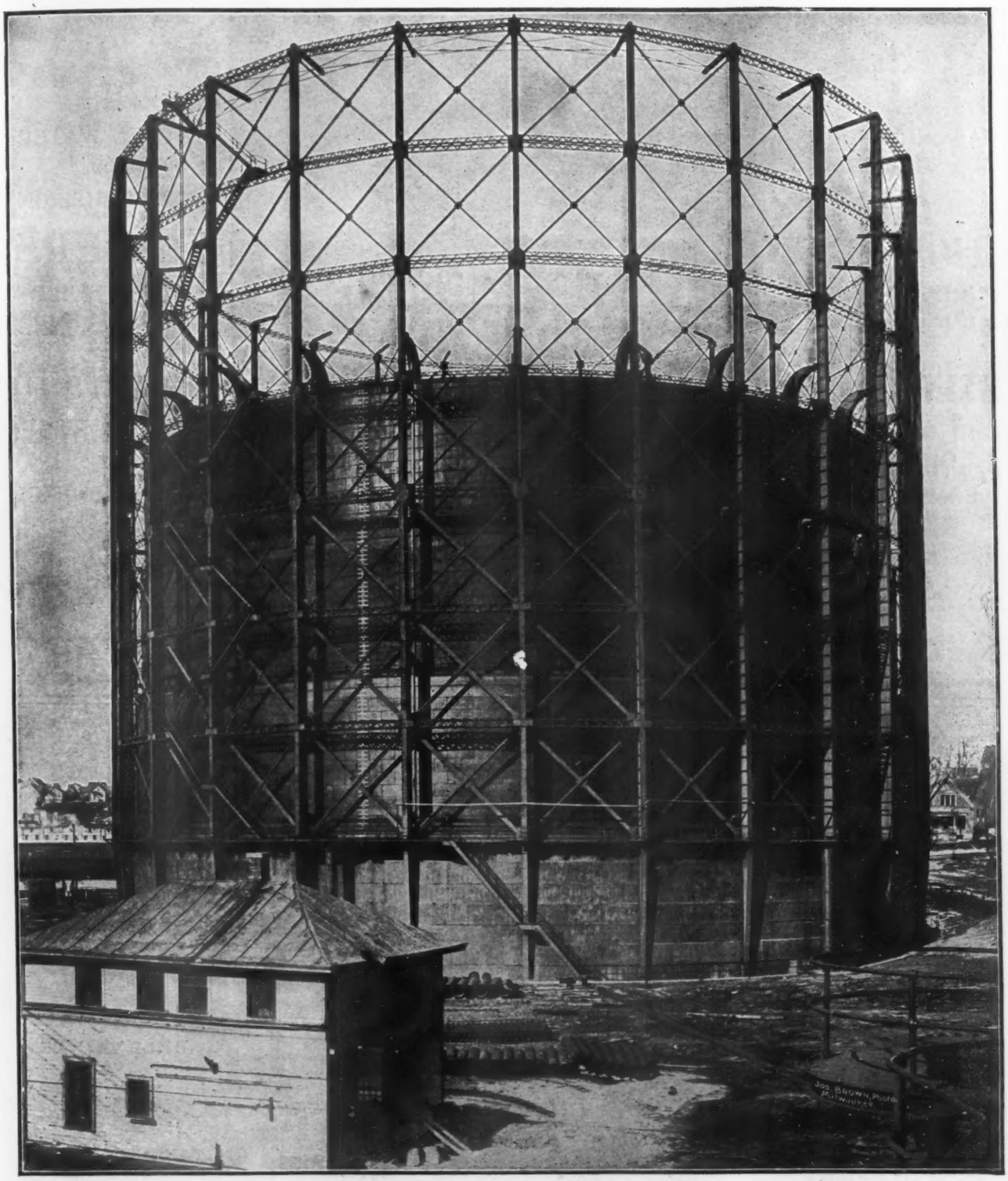

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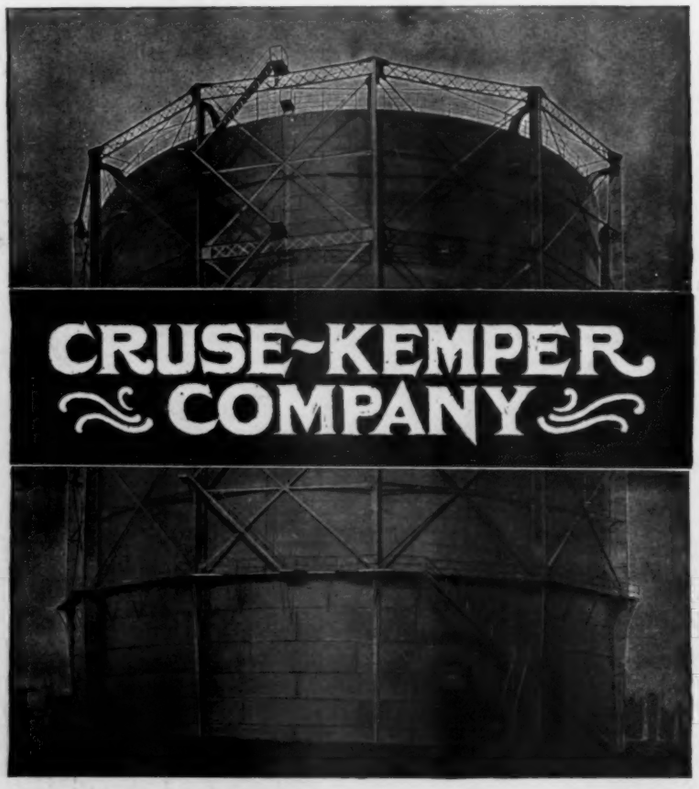

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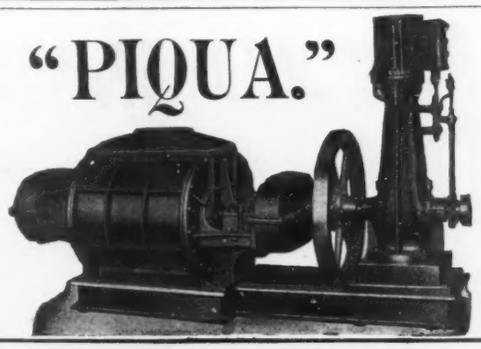

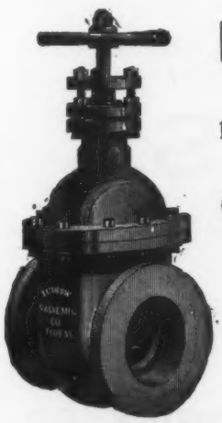

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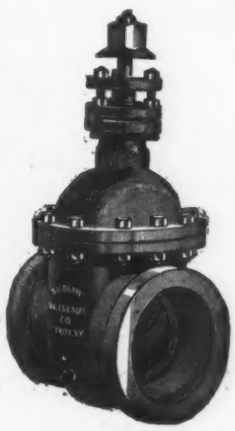

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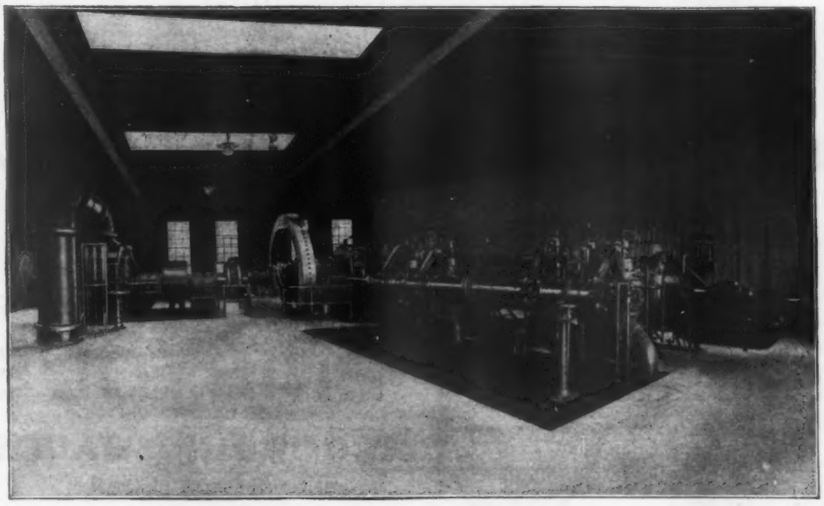

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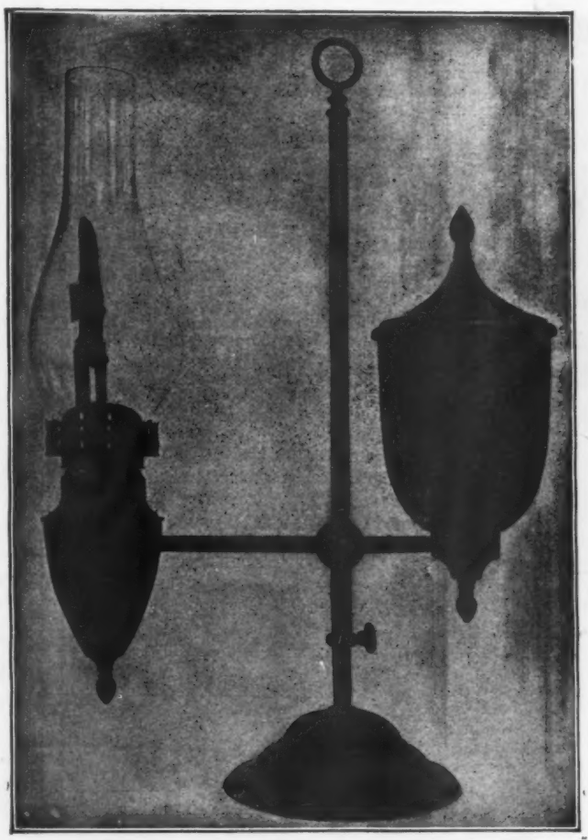
Fri.	1	6.10PM	8.20PM
Sat.	2	6.10	8.50
Sun.	3	6.10	9.30
Mon.	4	6.10	10.20
Tue.	5	6.10LQ	11.10
Wed.	6	6.10	12.10AM
Thu.	7	6.10	1.10
Fri.	8	6.10	2.20
Sat.	9	6.10	3.20
Sun.	10	6.00	5.10
Mon.	11	6.00	5.10
Tue.	12	6.00	5.10
Wed.	13	6.00NM	5.10
Thu.	14	6.00	5.10
Fri.	15	6.00	5.10
Sat.	16	6.00	5.10
Sun.	17	5.50	5.20
Mon.	18	6.50	5.20
Tue.	19	7.30	5.20
Wed.	20	8.20	5.20
Thu.	21	9.20LQ	5.20
Fri.	22	10.30	5.20
Sat.	23	11.40	5.20
Sun.	24	1.00AM	5.20
Mon.	25	2.10	5.20
Tue.	26	3.30	5.20
Wed.	27	No L.	No L.
Thu.	28	No L.FM	No L.
Fri.	29	No L.	No L.
Sat.	30	5.30PM	7.20PM
Sun.	31	5.30	8.10

TOTAL HOURS DURING 1909.

By Table No. 1.

	Hrs.Min.
January	212.20
February	183.40
March	173.00
April	151.10
May	144.10
June	138.50
July	145.40
August	160.30
September	180.00
October	201.00
November	216.30
December	233.40
Total, yr.	2140.30



THE ELLIOTT KEROSENE STANDARD PHOTOMETER LAMP.

***

10-Candle Power.

***

This lamp is a perfect substitute for the 10-candle Pentane Lamp hitherto used, and has the following advantages:

1st. It uses Standard Kerosene Oil (Pratt's Astral Oil or equivalent).

2d. It is remarkably steady. Will burn 24 hours continuously with less than 2 per cent. variation.

3d. It is much less dangerous than Pentane, which is a kind of gasolene.

4th. It is not easily affected by air currents in the photometer room.

5th. Since the lamp may burn continuously, the candle power of gas may be taken at any moment, if necessary. This insures steady illuminating power without waste of carburetting material.

6th. The first cost of the lamp brings it within the reach of even small gas works.

7th. Costs much less to maintain than a Pentane lamp or sperm candles doing the same service.

8th. Is not affected by the weather.

PUBLIC LIGHTING TABLE.

OCTOBER, 1909.

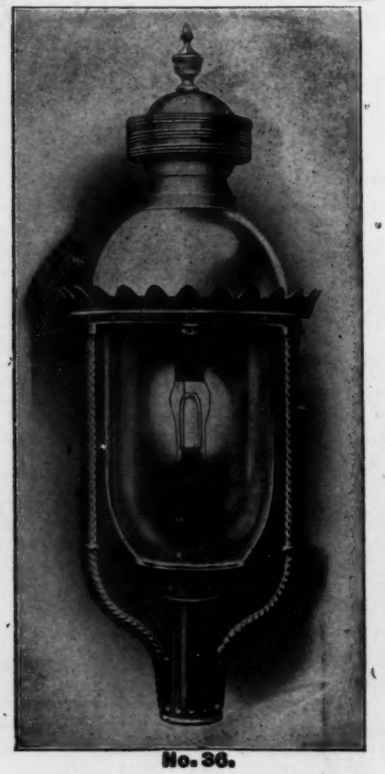
Day of Week.	Date.	Table No. 2. NEW YORK CITY. ALL NIGHT LIGHTING. Complete Lighting in One Hour	Complete Extinguishing in 50 Minutes
		From Time Given	
		P. M.	A.M.
Fri.	1	5.22	4.42
Sat.	2	5.22	4.42
Sun.	3	5.22	4.42
Mon.	4	5.22	4.42
Tue.	5	5.22	4.42
Wed.	6	5.22	4.42
Thu.	7	5.22	4.42
Fri.	8	5.12	4.52
Sat.	9	5.12	4.52
Sun.	10	5.12	4.52
Mon.	11	5.12	4.52
Tue.	12	5.12	4.52
Wed.	13	5.07	4.52
Thu.	14	5.07	4.52
Fri.	15	4.57	5.02
Sat.	16	4.57	5.02
Sun.	17	4.57	5.02
Mon.	18	4.57	5.02
Tue.	19	4.57	5.02
Wed.	20	4.57	5.02
Thu.	21	4.57	5.02
Fri.	22	4.47	5.07
Sat.	23	4.47	5.07
Sun.	24	4.47	5.07
Mon.	25	4.47	5.07
Tue.	26	4.47	5.07
Wed.	27	4.47	5.07
Thu.	28	4.47	5.07
Fri.	29	4.37	5.17
Sat.	30	4.37	5.17
Sun.	31	4.37	5.17

TOTAL HOURS DURING 1909.

	Hrs.Min.
January	428.30
February	358.15
March	353.10
April	298.10
May	263.20
June	234.45
July	248.30
August	278.00
September	311.25
October	370.05
November	397.40
December	438.35
	3980.25
Deduct on account of 50 min. extinguishing time	30.25
Total, yr.	3950.00

NEW YORK, 318 West 42d Street. BOSTON, 820 Beacon Building. PHILADELPHIA, Broad and Arch Streets. ST. LOUIS, 712 Roe Building. CHICAGO, 218 La Salle Street. SAN FRANCISCO, 512 Oak Street.

WELSBACH STREET LIGHTING COMPANY



No. 36.

....OF AMERICA....

Controls and Operates the **Welsbach System of Street Lighting,**

Which includes its specially DESIGNED and PATENTED BURNER for PARK LIGHTING exclusively.

Uniformly SUCCESSFUL in 150 Cities and Towns.

By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

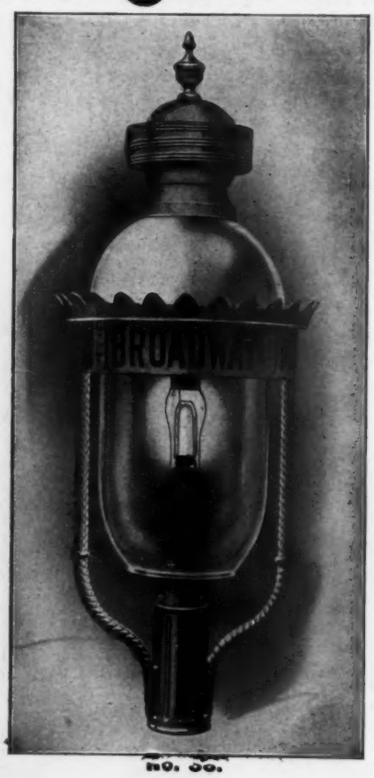
POINTS OF MERIT:

It is { Economical, Attractive, Successful, Up-to-date.

IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

Correspondence Solicited from Gas Companies and Others interested in Municipal and Outside Lighting.



No. 38.

Welsbach Inverted Portico Lamps

No. 901. INVERTED PORTICO LAMP. Single Burner.

For all semi-exposed places—porticos, entrances, etc. Simple in construction, few parts; exterior made of enameled steel, interior parts of heat-resisting material that are practically indestructible. Wind, storm and insect proof.

The globes on designs No. 901 and No. 902 are supported in a flanged reflector that provides for heat expansion. The reflector being hinged, it can readily be lowered for cleaning or trimming the lamp.

Gas and pilot-flame adjustment by means of needle valves from outside of lamp. The pilot-flame is protected and will not blow out.

Three Styles from which to Choose:

No. 902.

Equipped with No. 5 clear globe and steel enameled reflector 8⅜ inches in diameter and 1¼ inches deep. Finish, dark green enamel.

Dimensions: Length over all, 16 inches; diameter of globe, 5 inches; depth of globe, 4 inches. List price, complete, without mantles... $8.00

No. 900.

Equipped with 7-inch alabaster or sand-blast ball globe. Finish, dark green, or white and gold enamel. Dimensions: Length over all, 17½ inches.

White and gold enamel. List price, without mantles..... $9.00

Dark green enamel. List price, without mantles..... $8.00

No. 901.

Same as 902 portico lamp, except steel enameled reflector, which is flat, and 10 inches in diameter.

List price, complete, without mantles..... $8.00

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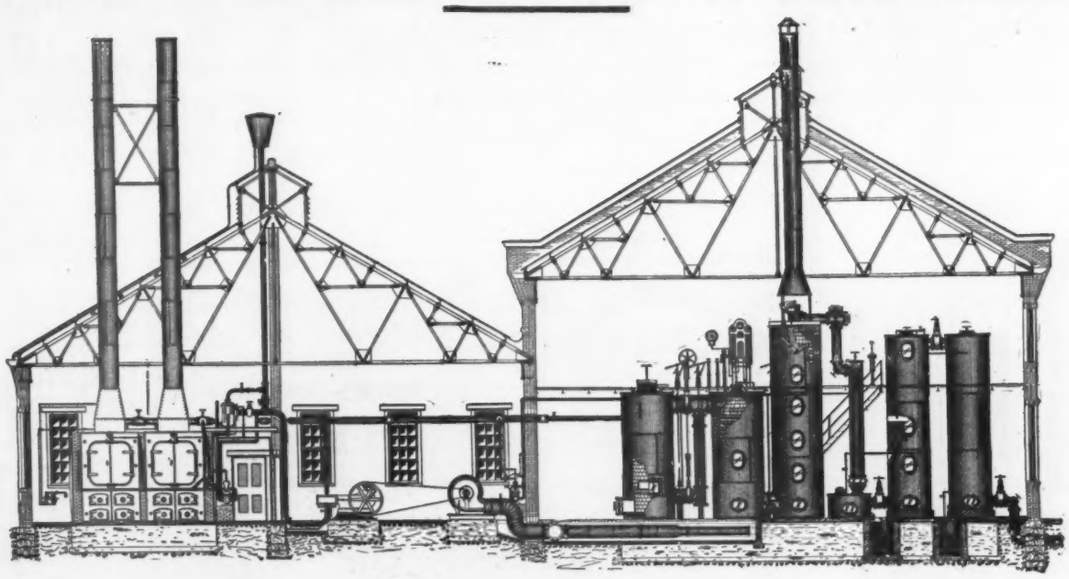
SOLE AMERICAN BUILDERS

OF THE

Standard Double-Superheater Lowe Water Gas Apparatus.



TOTAL SETS INSTALLED TO JULY 1, 1909, ... 704
TOTAL DAILY CAPACITY TO JULY 1, 1909, ... 577,440,000 cu. ft.

Tar Extractors for Carburetted Water Gas.
Photometrical Apparatus.
Gas Analysis Apparatus.
Recording Gauges.
Straight Standpipe System for Coal Gas Retorts.
Straight Standpipe Cleaners.
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Meters for Regulating Air and Steam Supply to Water Gas Apparatus.

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FLEMMING GENERATOR GAS FURNACE

GEROULD'S IMPROVED RETORT CEMENT.

A Cement of great value for patching retorts, putting on mouthpieces, making up all bench-work joints, lining blast furnaces and cupolas. This cement is mixed ready for use. Economic and thorough in its work. Fully warranted to stick.

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In Casks, 400 to 800 pounds, at 5 cents per pound.
In Kegs, 100 to 200 " " 6 " "
In Kegs less than 100 " " 7 " "

C. L. GEROULD,
29 North Mill St., New Castle, Pa.

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Universally accepted to be the best cement for patching and repairing retorts, making up bench work, etc. Advantages: Powdered form; only mix with water; no waste; too much mixed, apply water and use the next time; adheres very easy; does not fall out by decarbonization. We guarantee or take back. Many re-orders and recommendations from America, Germany, France, Belgium, etc. Write for price and testimonials.

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VERTICAL CHAMBERS.

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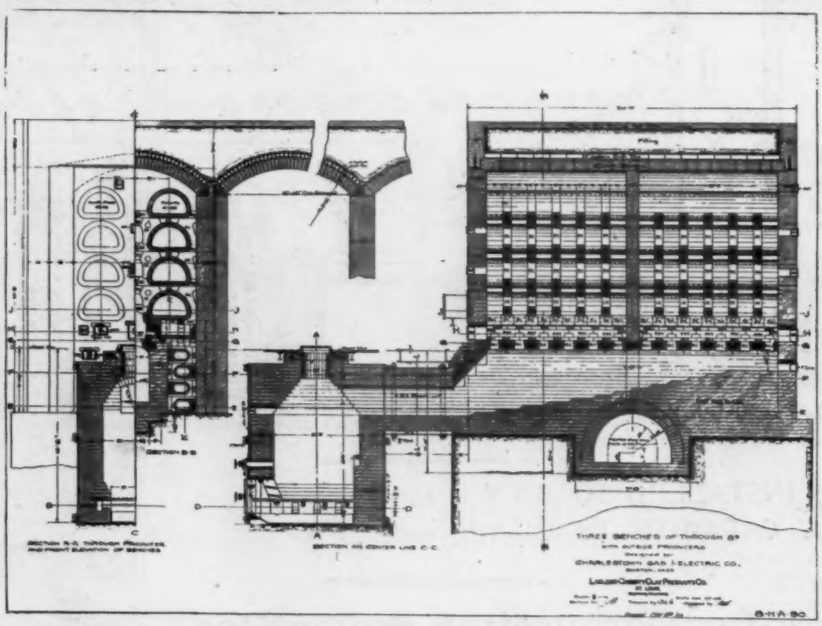

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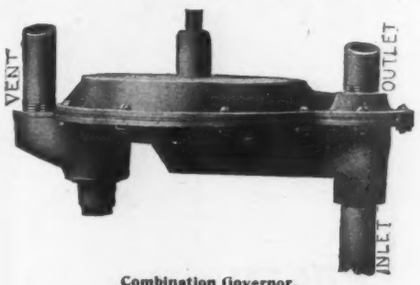

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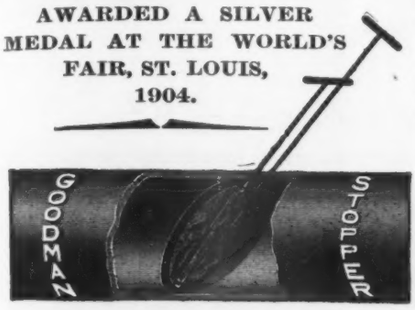

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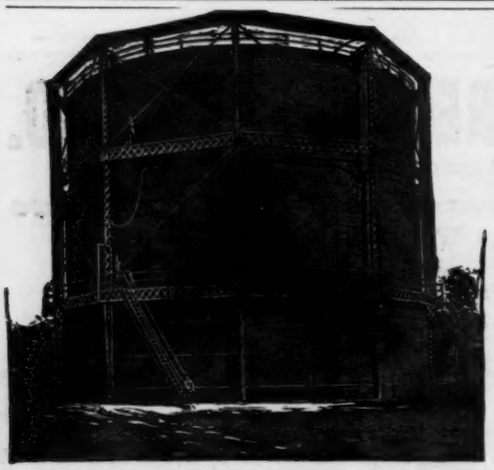

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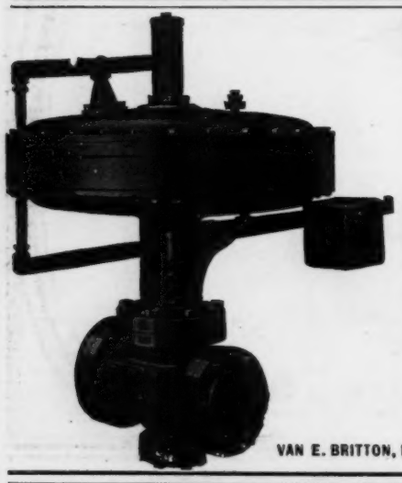

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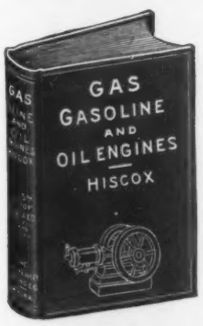

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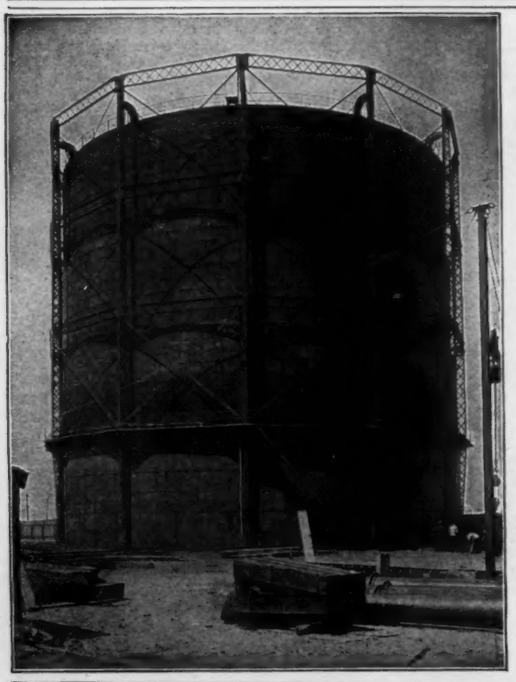

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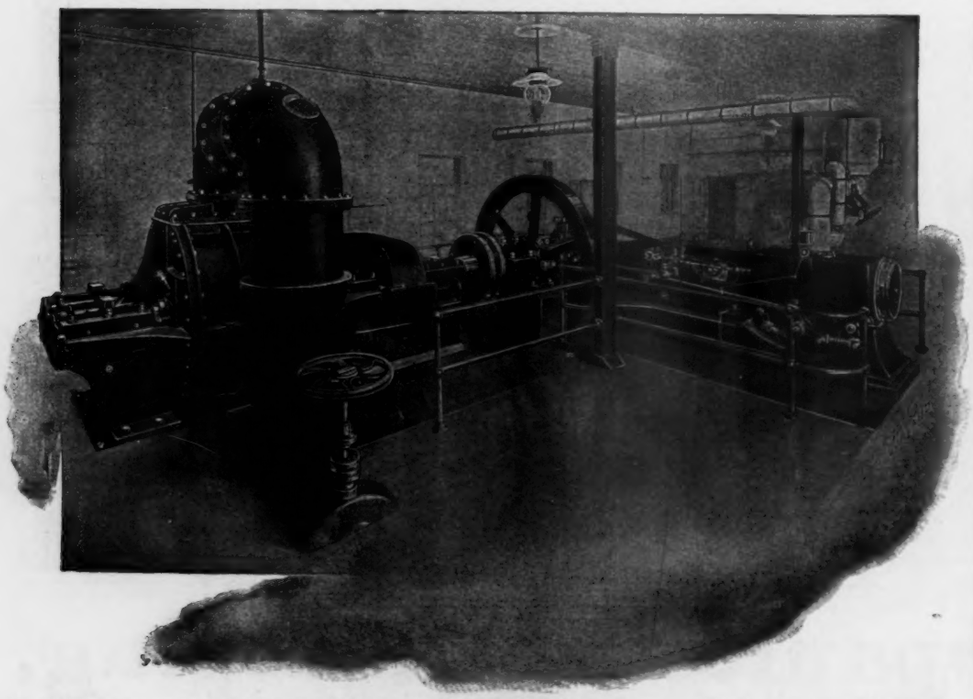

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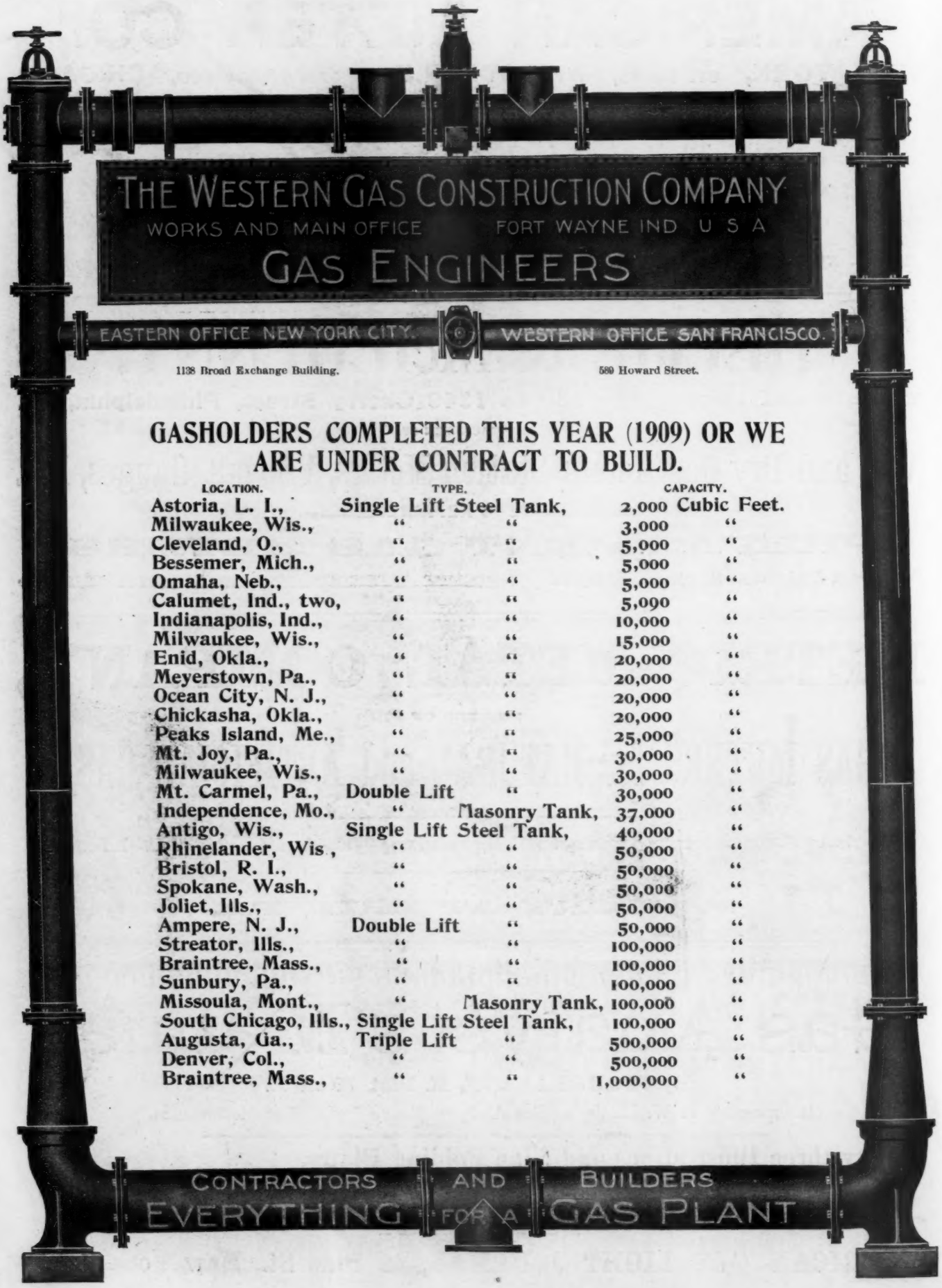
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